# DOCUMENT RESUME

ED 185 370 CE 024 923

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|---|---|
| AUTHOR | Albracht, James, Ed. |
| TITLE | Kansas Vocational Agriculture Education. Basic Core Curriculum Project, Horticulture III. |
| INSTITUTION | Kansas State Univ., Manhattan. Dept. of Adult and Occupational Education. |
| SPONS AGENCY | Kansas State Dept. of Education, Topeka. Div. of Vocational Education. |
| NOTE | 441p.; Not available in paper copy due to colored paper. For related documents see CE 024 921-922. |
| AVAILABLE FROM | Vocational Curriculum Materials Center, Pittsburg State University, Pittsburg, KS 66762 |
| EDRS PRICE | MF01 Plus Postage. PC Not Available from EDRS. |
| DESCRIPTORS | *Agricultural Education; Agricultural Engineering; Business Skills; Course Content; Greenhouses; Grounds Keepers; High Schools; *Horticulture; Human Relations; Landscaping; Learning Activities; Nurseries (Horticulture); Ornamental Horticulture; State Curriculum Guides; Teaching Guides; Units of Study; *Vocational Education |
| IDENTIFIERS | Kansas |

ABSTRACT

This secondary horticulture curriculum guide is one of a set of three designated as the basic core of instruction for horticulture programs in Kansas. Units of instruction are presented in eight sections: (1) Human Relations, (2) Business Operations, (3) Greenhouse, (4) Retail Flowershop Operation, (5) Landscape Nursery, (6) Lawn Maintenance, (7) Garden Center, and (8) Horticulture Mechanics. Each unit is comprised of the following parts: terminal objective, specific objectives, information sheets, assignment sheets, and unit test. (LPA)

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ED185570

Kansas Vocational Agriculture Education

## BASIC CORE CURRICULUM PROJECT

The identification of tasks performed by workers in the horticulture industry, and the preparation of instructional materials for use by teachers of horticulture programs.

# HORTICULTURE III

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Dean Prochaska, Director
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Topeka, Kansas 66612

CE 024 923

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Pittsburg State University, Pittsburg, Kansas 66762

# FOREWORD

This publication is one of a set of three designated as the basic core of instruction for horticulture programs in Kansas. The Kansas Horticulture core units will greatly assist instructors of vocational agriculture to effectively organize, plan and implement an instructional program for secondary students enrolled in vocational agriculture.

The horticulture industry is rapidly increasing in Kansas. Whether students or adults, we are in personal contact with many phases of horticulture in our daily lives. Fresh and processed fruits and vegetables are a part of our every day diets and are products of the horticulture industry. Likewise ornamental trees, shrubs, flowers and lawns are an established part of living as it relates to our homes, cities and highways. Because of this, horticulture offers many challenging opportunities in the tremendous use of horticulture plants for food, aesthetic and utility purposes and for students selecting a horticulture occupation. The student must also receive training through a supervised occupational experience program.

Appreciation is expressed to Dr. James Albracht for directing and coordinating the project, to the teachers who dedicated their time in developing individual units and to the industry specialists who provided the technical assistance in completing the units contained in this publication.

Les Olsen
Education Program Specialist
Agriculture Education

# ACKNOWLEDGEMENTS

Appreciation is expressed to the many individuals for their assistance in the preparation of this publication. Special thanks are extended to the New Mexico State Department of Education for permission to use the New Mexico Core Curriculum as a source of information.

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# HUMAN RELATIONS

## UNIT 1

## EMPLOYER VIEW

### TERMINAL OBJECTIVE

Upon completion of this unit, the student will be able to describe the effect on the employer of employee actions and situations in work habits, attitudes, and work situations in common work experiences. This objective will be considered achieved upon attainment of a score of at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, the student will be able to:

1. Identify those personality traits the employer considers essential for an employee to demonstrate a good attitude.
2. Describe a work habit to illustrate each of the eleven employer expectations.
3. Describe three work habits that employers dislike.
4. Demonstrate the proper attitude for accepting criticism.
5. Explain the employer's view of "A full day's pay for a full day's work".

# HUMAN RELATIONS

## UNIT 1

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Discuss Terminal and Specific Objectives
3. Discuss Handouts
4. Provide students with Information and Assignment Sheets
5. Discuss Assignment Sheets
6. Prepare Transparencies
7. Invite an employer or a panel of employers to discuss TM 4 - Balance Sheet
8. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Study Handouts
4. Complete Assignment Sheets
5. Discuss Handouts with an employer
6. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Transparencies
   TM 1 - Employer Taxes
   TM 2 - Worker Attitudes
   TM 3 - What an Employer Expects of an Employee
   TM 4 - Balance Sheet - Why the Boss Has Good Days and Bad Days
   TM 5 - Respect, Influence, Magnetism
4. Assignment Sheets
   #1 - Worker Attitudes
   #2 - Geographic Influence

## SUGGESTED ACTIVITIES

5. Handouts
    - #1 - Terms
    - #2 - Loyalty
    - #3 - Look For More Troubles
6. Test
7. Answers to Test

References:

1. Kimbrell, Grady, and Vineyard, Ben S., Succeeding in the World of Work, McKnight Publishing Company, Bloomington, Illinois, 2nd Ed., 1975.
2. Student Manual for Occupational Relations, The College of Edcuation, University of Minnesota, Minneapolis, Minnesota, 55455.

# HUMAN RELATIONS
## UNIT 1
## INFORMATION SHEET

I. Explain the terms (H.O. #1) so the students will be sure to understand their meaning.

II. Play a game using the terms

1. Tic Tac Toe
2. Relay

III. Transparency of Taxes Employer Pays (TM 1)

1. Income taxes for Federal, State, and Local.
2. Payroll taxes usually start at 4% of payroll and are paid quarterly.
3. Social Security is matched by the employer so double the amount withheld from the employee is paid to the federal government (6.05%)
4. Assessment taxes are usually paid in the form of property taxes.
5. Severance taxes are paid by those companies that extract minerals from the ground such as oil, coal, etc.
6. Unemployment tax is another tax applied to the total payroll.
7. Licenses are usually required of businesses that provide a service such as plumbing or electrical.
8. Workmans compensation is a form of insurance required of nearly every employer. It too is based on the amount of wages paid.
9. Workmans insurance is usually a fringe benefit provided at the employer's option.
10. Sales taxes have to be paid on net sales even if not collected from customers.
11. A fee is usually paid by businesses that operate as a franchise. An example would be McDonalds.
12. Like everyone else, business has to pay taxes on the gasoline they use in their cars and trucks.
13. Truck owners have to pay taxes in the form of license tags. These taxes may run into several thousand dollars each year for one vehicle.

IV. Transparency of Positive and Negative Attidudes (TM 2)

1. Smiling is a way of acting happy and pleasant. It is almost impossible to act angry while you are smiling. Others will usually smile if you smile first at them.
2. Your committment to your job will be evident if you are required to change some of your ideas, or maybe even your behavior. Sometimes the employer will want you to wear certain clothing, or cut your hair, to suit the customers rather than to suit you. How much you risits these changes will show how adaptable you are.

INFORMATION SHEET

3. Sometimes we think we know what is right. But it is always best to let the other fellow tell his ideas - he might have thought of something you have overlooked. If it is a disagreement, put yourself in his position and try to feel as he does. (Haven't you tried to get your parents to do this very thing when you wanted to use the car?)

4. An occasional complaint may be all right, but too many complaints mark you as an unhappy person. You should try to make some changes in your personality, your work habits, and your attitude.

5. You have heard about accentuating the positive, haven't you? Well, this is what you should do when you are dealing with people. You can find a good part in almost everything and everybody. However, when you are teaching someone to do something (a new employee, or a supervisor teaching you a new job) you need to analyze their performance and make comparative judgements on how to improve - this is constructive criticism. Do it in a friendly, helpful way.

6. Many people feel eye contact is necessary to get the full meaning of what a person is saying. Looking away and perhaps looking around indicates you are not really interested in the person you are talking with at the moment. It may also mean you are not interested in listening to what you are being told - employers are very sensitive about this.

7. Excuses are a waste of time. In business you need to think and act objectively - that is, with facts. Tell it like it is. Then you and others will not waste time and you are less apt to make the same mistake again.

8. Try not to get stuck on a single track. Wouldn't it be dull if you had to study the same subject all day, all year, year after year? Working can be the same way - playing can be the same way. If you had to stay in the same car hour after hour, day after day, you would soon be tired of it too. You, like everyone else needs variety. So learn about all the different things you can. Learn all you can about your job. Where, when, and how each tool, product, material, equipment, customer, and everything else started, and what it takes to keep them going. If you try to find out all these things you won't have time to get bored. Your boss will think you really are interested in your job and the company and he will probably give you a raise and/or a promotion.

V. Transparency - What an Employer Expects from an Employee (TM 3)

1. If you hire someone to work for you, like a plumber, or an electrician, are you willing to pay eight hours labor if only five hours work is done? Your employer is no different. When he hires you he wants a full day's work for a full day's pay - every hour of it - the same as you would

INFORMATION SHEET

2. Rules, regulations, policies, orders, all are to keep the business in order, running smooth, and to prevent losses. When you do not keep a business rule you will almost always cost the company money. The employer has probably spent a lot of time and money figuring out the best way to do things. So, do them his way. If however, after you have been doing something for six months and you know why it is done the way it is and you still think it should be done differently, then you should talk to your supervisor, or employer about changing. Never change a rule, regulation, policy, or order without consulting with the supervisor or employer.

3. When you are at work, every item you see in your store, shop, plant, or business has been purchased with money. Your employer's money. When he looks at those things he sees his money. If you are careless or wasteful he will see you as throwing his money away. For fun, lets make a list of supplies each of you use at your job. Then find out how much each item costs so the next time you throw one away you will know how much of your employer's money you are throwing away. Also, if you work for the minimum wage of $2.30 per hour and you don't work for ten minutes out of each hour you are throwing away 38¢ of your employer's money. I'm sure there are other ways he would like to spend his money.

4. Let's say our football team is working on a new play so we can beat our toughest opponent. After practice you go for a coke with a friend and you are talking to him about the new play. The guy in the next booth overhears you and he tells the opponents coach. On the day of the big game your opponent is ready to stop your play. Business works the same way. Whatevery you do at work should stay at work. You never know when your conversation will reveal your company. It may mean your job so protect your job by not talking about company business outside the business.

5. You probably felt your employer was a pretty nice guy when he hired you. You probably thought he knew what he was doing. Well, he is the same guy that put your supervisor where he is today. Listen to your supervisor and do just as he says. If you have problems and don't think things are going as they should, talk to your coordinator about it. After you are out of school, if this comes up you should talk to the supervisor and try to get it straightened out.

6. There are several routine jobs wherever you work. Find out what they are, how they are to be done, when they are to be done, and if you can do them when you have nothing else to do. Then when your supervisor, or boss is busy when you complete a job, you won't need to stand around and waste you boss' money, you can start right away on one of the routine jobs. If your boss is busy when you report to work and you don't know what to do until you talk to him, don't just stand around and wait - get busy on one of those routine jobs - show you have initiative.

INFORMATION SHEET

7. Being on time at work means getting there in time to get your work clothes on, get to your work station and be ready to work at the right time. If you are to be at work at 3 p.m. and you walk in the door at 3 p.m. you are late to work because you are not at your work station ready to work. If something happens and you know you can't get there on time - call - the boss or someone else may be waiting to do something with you. If you call they can change their plans until you get there. Bosses feel much better if you call, but they soon get unhappy if it happens very often.

8. You were hired to be there every day. If you can't be there when you were hired to be there the boss will want to hire someone who can be there. The boss also knows the other workers will be unhappy if he lets one person get away with not being there every day. He also knows they will be unhappy because some of the work isn't getting done or because they are having to do the work.

9. Appearance will vary from job to job. Be sure you talk with your supervisor and know what he wants you to wear - he may say one thing is alright, but if he prefers you wear a certain type of clothing you will impress him by doing as he wishes. He probably feels it affects customer relations.

10. Loyalty is always saying the good things about who you work for and with. Again accentuate the positive. If you try to run down people or your job, both will soon be running you down and you'll both be unhappy.

11. Success in any job is 80% getting along with people. It seldom makes any difference if you are the best there is at a particular job, if you just can't get along with the people that work there, they won't want you around. So, adapt your conduct, work habits, and attitudes to get along with the people you work with and you will find your boss adapted to your type of work attitude.

VI. Transparency #4.

1. If you can put all of the personality traits on the left down as part of your work attitude, you will automatically obtain from your boss, supervisor, and fellow workers, the items listed on the right side.

2. Demonstrating those traits in your work will gain you respect, influence in the form of admiration and employers seeking your services, and the magnetism of workers wanting to work with you. All of these make the type of worker an employer is proud to employ.

VII. Handout #5. Balance Sheet, or Why the Boss Has Good Days and Bad Days.

1. Assets:

   a. Employees that are at work on time demonstrate the trait of dependability.

INFORMATION SHEET

b. Initiative shows when employees keep busy without being told.

c. If sales are up the boss knows he will have money to keep the place in operation. He should be all smiles.

d. Only minor complaints means the workers are on their toes and doing good work. The boss is happy because orders are being followed.

e. Customer compliments means good will and increased sales. Prices are less apt to have to be reduced. Besides the boss is human, he likes a compliment the same as you do.

f. Accidents cost money in lost time and disrupted work schedules. The production rate falls when a worker has been injured so the boss would be losing money with every accident. No accident also means fewer problems - fewer straws to break his back.

g. Employee attitude must be good if they are careful with materials and equipment. If they are not careful then the boss' attitude is real sour because they are throwing away his money.

h. Honesty is expected from all employees. This is perhaps the most important trait. It is required by all employers.

i. This is another expression of attitude.

j. Employees that are eager to be trained and advance on the job show ambition. The employer likes people with ambition because they not only help to make money, they are the ones he will expect to advance to better jobs as the business grows. Those that accept new ideas are adaptable and will make the changes necessary to keep the business up to date. Those that accept criticism show a sense of humor in that they are not too self centered to learn and improve their work.

k. Again the employer feels every employee should be proud of where he works. If the employee lacks loyalty and "runs down" the business, he "runs down" himself because he is a part of the business. The employer will appreciate the employee that will tell him what he thinks is wrong with the business instead of telling it to outsiders.

## HUMAN RELATIONS

## UNIT 1

## TERMS

1. Rules - Established operational procedures, guides, or actions of conduct.
2. Regulations - Controls to direct, govern according to rules or principles.
3. Policies - Governing principles, plans or course of action set down by individuals, groups and/or government.
4. Dependability - Always on time, able to carry as assignment to completion independently.
5. Loyalty - Faithful to a firm and its employees. Always speak in favor of the firm its business matters, and its employees.
6. Attitude - The manner of acting, feeling, or thinking that shows one's disposition.
7. Adaptability - Being able to adjust to, or conform to, a new set of circumstances.
8. Criticism - The act of making judgements and evaluation of comparative worth.
9. Potential - Expresses possibility, or capability of coming into being.
10. Ambition- The desire to achieve something.
11. Cooperation - Thinking and doing for the welfare of others.
12. Courtesy - Politeness and acting with manners.
13. Enthusiasm - Excitement felt in performing a given activity.
14. Foresight - Able to look ahead of present circumstances and be aware of the future.
15. Honesty - Being truthful. Showing fairness and straightforwardness of conduct.
16. Industry.- Diligence in any project - doing all you can on a project.
17. Initiative - Ability to go ahead on your own without being told to do so.
18. Responsibility - The carrying out of assignments, and the seeing through of a job.
19. Sense of humor - Being cheerful and being able to avoid being serious about yourself.
20. Persistence - Ability to stick with a job or exercise until it is completed.

HUMAN RELATIONS
UNIT 1

## LOYALTY

If you work for a man, in heaven's name work for him; speak well of him and stand by the institution he represents * * * remember - An ounce of loyalty is worth a pound of cleverness * * * * * * * * * * if you must growl, condemn, and eternally find fault, why - resign your position and when you are on the outside, damn to your heart's content * * * * * * * * * * * * * * * * but as long as you are a part of the institution do not condemn it * * * if you do, the first high wind that comes along will blow you away, and probably you will never know why * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

* * Elbert Hubbard.

# HUMAN RELATIONS

## UNIT 1

# LOOK FOR MORE TROUBLES

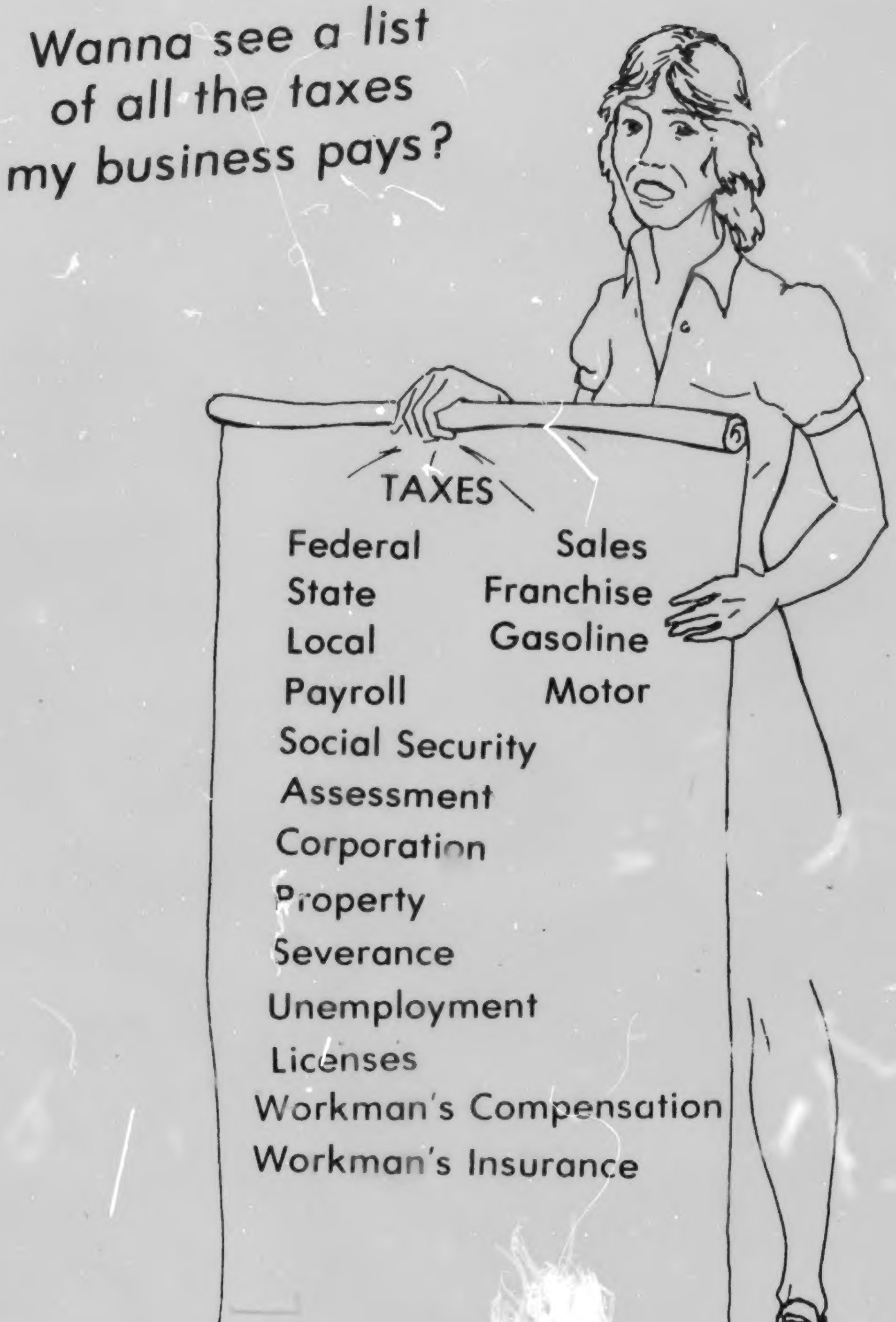
By

Robert R. Updegraff

Be THANKFUL for the troubles of your job. They provide about half your income. Because if it were not for the things that go wrong, the difficult people you have to deal with, and the problems and unpleasantnesses of your working day, someone could be found to handle your job for half of what you are being paid.

It takes intelligence, resourcefulness, patience, tact, and courage to meet the troubles of any job. That is why you hold your present job. And it may be the reason you aren't holding an even bigger one.

If all of us would start to look for more troubles, and learn to handle them cheerfully, and with good judgement, as opportunities rather than as irritations, we would find ourselves getting ahead at a surprising rate. For it is a fact that there are plenty of big jobs waiting for men and women who aren't afraid of the troubles connected with them.


Wanna see a list of all the taxes my business pays?
TAXES
Federal
State
Local
Payroll
Social Security
Assessment
Corporation
Property
Severance
Unemployment
Licenses
Workman's Compensation
Workman's Insurance
Sales
Franchise
Gasoline
Motor

## TRANSPARENCY #2: Worker Attitudes

| POSITIVE ATTITUDES | NEGATIVE ATTITUDES |
|---|---|
| Smiles easily | Rarely smiles |
| Willing to change ideas, dress behavior when appropriate | Unwilling to change |
| Able to see the other person's point of view | Unable to see the other person's point of view. |
| Almost never complains | Complains about nearly everything. |
| Accepts responsibility for mistakes | Blames others for own mistakes and shortcomings. |
| Seldom criticizes others | Very critical of others. |
| Consider what is helpful or good for others | Thinks only of self, "What's in it for me?" |
| When talking to other people looks them in the eye, but does not try to stare them down. | Unwilling or unable to look the other person in the eye. |
| Respects the ideas and opinion of others | Tries to force ideas and opinions on others |
| Never makes excuses | Often makes excuses |
| Has a variety of interests | Few interests, if often bored |

TRANSPARENCY #3: What an Employer Expects of an Employee

1. A full day's work for a full day's pay.
2. Adherence to employer's rules, regulations, policies, orders.
3. Proper care of employer's tools, materials, equipment and supplies.
4. Good judgement in handling confidential company information.
5. Respect for superiors on the job.
6. Use of initiative on routine jobs.
7. Promptness in reporting for work.
8. Regular attendance on the job.
9. Good personal appearance.
10. Loyalty
11. Getting along with other people.

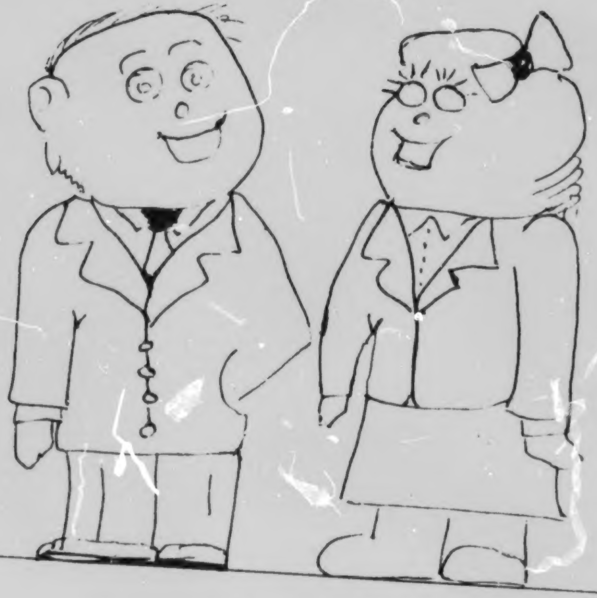
## HUMAN RELATIONS

## UNIT 1

## BALANCE SHEET: Why the Boss has Good Days and Bad Days

| ASSETS (Good Days) | LIABILITIES (Bad Days) |
|---|---|
| All employees are at work on time | One or more employees report to work at the last minute or late. |
| Employees keep busy without being told | Employees loaf for short periods after each task is completed and wait to be told what to do next. |
| Work is completed even though the boss or supervisor is not present. | Employee production drops whenever boss or supervisor is not present. |
| Sales for the day are above average. | Sales for the day are below average. |
| Only minor customer complaints. | Major customer complaints. |
| Customer compliments firm's good workers. | Customers complain about his workers or their workmanship. |
| No accidents-Safety record advances. | Accidents occur-Safety record falls. |
| Observes employees showing concern for materials and equipment. | Employees are careless with stock and waste supplies. |
| Has a feeling of trust about employees. | Has the feeling stock shortages are due to employee pilferage. |
| Observes employees showing care for tools and equipment. | Observes employees being careless with tools and equipment. |
| Has employees that are eager to be trained accept new ideas, accept criticism, and want to advance on the job. | Has employees that want to advance on the job but do not want to study, accept new ideas or criticism, or train for a new position. |
| Employees speak well of the company. | Employees tell customers about faults of the firm and the employees. |

RESPECT INFLUENCE MAGNETISM



(BUILD YOUR IMAGE ON THESE PERSONALITY TRAITS)

COOPERATION AMBITION INDUSTRY

HONESTY LOYALTY COURTESY RESPONSIBILITY

## HUMAN RELATIONS

## UNIT 1

### ASSIGNMENT SHEET #1: Worker Attitudes

For each of the following, wrtie in something you can do on your job to demonstrate to your employer that you are fulfilling his expectations.

1. A full day's work for a full day's pay. ______________________
______________________________________________________

2. Adherence to employer's rules, regulations, policies, orders. ____
______________________________________________________
______________________________________________________

3. Proper care of employer's tools, materials, equipment, and supplies.
______________________________________________________
______________________________________________________

4. Good judgement in handling confidential company information. ____
______________________________________________________
______________________________________________________

5. Respect for superiors on the job. ______________________
______________________________________________________

6. Use of initiative on routine jobs. ______________________
______________________________________________________

7. Promptness in reporting for work. ______________________
______________________________________________________

8. Regular attendance on the job. ______________________
______________________________________________________

9. Good personal appearance. ______________________
______________________________________________________

10. Loyalty ______________________________________________
______________________________________________________

11. Getting along with people ______________________
______________________________________________________

## HUMAN RELATIONS

## UNIT 1

### ASSIGNMENT SHEET #2: Geographic Influence

You work for a company in a community of 4,000 people. Your company has offered you a job in the home office in a city 100 miles away. List the factors contributing to your decision to take the job.

What other factors would be involved if the home office was only 30 miles away and you were to commute to the home office three days a week?

# HUMAN RELATIONS

## UNIT 1

## TEST

1. Identify those personality traits which an employer will consider essential for an employee to demonstrate a good attitude.

_____a. Very critical of others

_____b. Consider what is good or helpful to others

_____c. Blames others for own mistakes or shortcomings

_____d. Willing to change ideas, dress, or behavior when appropriate

_____e. Respect the ideas and opinions of others

_____f. Unwilling or unable to look the other person in the eye

_____g. Often makes excuses

_____h. Has few interests, is often bored

_____i. Unable to see the other person's point of view

_____j. Complains about nearly everything

_____k. Smiles easily

2. Describe a work habit to illustrate each of the eleven employer expectations.

a. A full day's work for a full day's pay. ______________________________

________________________________________________________________

b. Adherence to employer's rules, regulations, policies, and orders.

________________________________________________________________

________________________________________________________________

c. Proper care of employer's tools, materials, equipment, and supplies.

________________________________________________________________

________________________________________________________________

d. Good judgement in handling confidential company information. _____

________________________________________________________________

e. Respect for superiors on the job. ______________________________

________________________________________________________________

f. Use of initiative on routine jobs. ______________________________

________________________________________________________________

g. Promptness in reporting for work. ______________________________

________________________________________________________________

h. Regular attendance on the job. ______________________________

________________________________________________________________

## TEST

i. Good personal appearance. ______________________________

____________________________________________

j. Loyalty ______________________________

k. Getting along with other people. ______________________________

____________________________________________

3. Describe three work habits which employers dislike.

4. Describe the proper attitude for accepting criticism.

5. Explain the employer's view of "A full day's pay for a full day's work".

## HUMAN RELATIONS

## UNIT 1

## ANSWERS TO TEST

1. b e
   d k

2. Similar wording with approval of the instructor.
   a. Work efficiently the entire hours you spend at your job.
   b. Follow the procedures used by the shop.
   c. Do not waste supplies and always use equipment correctly.
   d. Do not talk about the company business outside of the shop.
   e. Listen to supervisor and follow directions.
   f. Do routine jobs during slow periods. Keep busy.
   g. Be on time and ready to go to work at the assigned time.
   h. Be reliable - be on the job on the days assigned to you.
   i. Find out if special clothing is required in your job - if so, wear it. Maintain a neat appearance at all times.
   j. Say good things about your company.
   k. Adapt your conduct, work habits, and attitude to the people with whom you work.

3. Any three of the following:
   a. One or more employees report to work at the last minute or are late.
   b. Employees loaf for short periods after each task is completed and wait to be told what to do next.
   c. Employee production drops whenever boss or supervisor is not present.
   d. Customers complain about the workers or their workmanship.
   e. Employees are careless with stock and waste supplies.
   f. Observes employees being careless with tools and equipment.
   g. Has employees that want to advance on the job but do not want to study, accept new ideas or criticism, or train for a new position.
   h. Employees tell customers about faults of the firm and the employees.

4. Similar wording with approval of the instructor.

   Realize that as an individual your are not perfect. Agree that you may need improvement. Find out what needs to be corrected and work on that area. Be cheerful about criticism.

5. Similar wording with the approval of the instructor.

   To an employer time is money. When an employee does not do his/her job this means wasted money. It is not fair to the other employees if one worker does not do the required work. It is bad for the morale of the entire shop.

# HUMAN RELATIONS

## UNIT 2

## SELF-EVALUATION

### TERMINAL OBJECTIVE

Upon completion of this unit, the student will be able to discuss qualities for self-improvement needed to work for employers and to formulate personal satisfaction by developing a positive self-image. This objective will be considered achieved by the students rating themselves on the self-evaluation sheets and by scoring at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

Upon completion of this unit, the student will be able to:

1. Define terms on self-evaluation.
2. List six factors to consider in self-evaluation.
3. Discuss in groups the information in the student handouts.
4. Complete assignment sheets on self-evaluation ot the satisfaction of the instructor.

## HUMAN RELATIONS

## UNIT 2

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information, Handout, and Assignment Sheets
3. Discuss Terminal and Specific Objectives
4. Discuss Information, Handout, and Assignment Sheets
5. Have students make a list of personality traits and construct a bulletin board of this information.
6. Assign students into groups and provide each group with questions for discussion.
7. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Complete each Handout and Assignment Sheet
4. Complete activities assigned by instructor
5. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Assignment Sheets
    #1 - Individual Needs Survey
    #2 - Personality Rating Scale
    #3 - Attitude Inventory
4. Student Handouts
    #1.- Developing Self-Concept
    #2 - Twenty Personality Factors
5. Test
6. Answers to Test

References:

Kimbrell, Grady and Vineyard, Ben S., Succeeding in the World of Work, McKnight & McKnight Publishing Co., Bloomington, Illinois. 1970.

# HUMAN RELATIONS

## UNIT 2

## INFORMATION SHEET

I. Terms and Definitions

- A. Values - What is important to each individual.
- B. Aptitudes - A natural talent which makes it easier to do a given activity.
- C. Ability - Able and skillful to do a given task.
- D. Self-image - The feelings one has about oneself.

NOTE: The average person will be changing the kind of work he does 5 times in his lifetime. You must learn all you can about yourself - your values, interests, attitudes, abilities, and your personality.

II. Traits You Must Learn About Yourself

- A. Values
- B. Interests
- C. Ability to work with people, things, and ideas.
  1. If you like people and objects, look for jobs that offer both.
  2. If you like to work with people and their ideas, choose a job in that area.
  3. If you like working with people, things, and ideas, choose a job in that area.
- D. Personality Traits
  1. Attitudes
  2. Courtesy
  3. Dependability
  4. Desire to succeed
  5. Enthusiasm
  6. Foresight
  7. Friendliness
  8. Honesty
  9. Initiative
  10. Loyalty
  11. Morality
  12. Neatness

## INFORMATION SHEET

13. Open-mindedness
14. Personal appearance
15. Punctuality
16. Self control
17. Sense of humor
18. Tact
19. Use of voice

E. Qualities of an attractive speaking voice

1. A medium to low tonal range.
2. Relaxed rather than tense.
3. Loud enough to be heard, but not booming.
4. Clearly and properly enunciated words.
5. Correct pronunciation.
6. Variation in talking speed.
7. Inflections properly used. (accenting meaning)

F. Self-evaluation Inventory

1. What jobs have I had?
2. What did I like about each? What did I dislike?
3. What skills do I have?
4. What does my education qualify me for?
5. What are my real interests?
6. Do I have any special talents or aptitudes?
7. Does my physical condition limit me in any way?
8. What kind of a job do I want?

G. Rating Yourself

1. Your appearance
2. Your work history
3. Your attitude
4. Your contribution to the interview.
5. Your departure

## INFORMATION SHEET

H. Controlling Emotions

1. Poise - control over emotions
2. Understand yourself

   Impatient? Easily angered or annoyed? Jealous? Envious? Sarcastic? Too easy going? Always want to be the leader? Do unusual things to attract attention? Criticize others? Complain? Become easily offended?

3. Be tolerant toward others

   Count to ten before you speak or act.

4. Laugh at yourself
   a. Be a good sport.
   b. Laugh off an awkward situation.
5. Have some goal always in mind
   a. Have an interesting plan.
   b. Think ahead.
6. Keep an open mind
   a. Listen to new ideas.
7. Think "I Can"
8. Preserve your good health
9. Control your emotions
10. Appreciate and value yourself
11. Be tactful
    a. Be kind.
12. Be discreet
    a. "I tell some and I keep some."
13. Put away your doubts and fears

# HUMAN RELATIONS

## UNIT 2

## ASSIGNMENT SHEET #1: Develop Self-Concept

How would you go about developing your self-concept to like yourself better?

## HUMAN RELATIONS

## UNIT 2

## ASSIGNMENT SHEET #2: Individual Needs Survey

Key: S - Strong Need L - Low Need
M - Some Need N - No Need

| S | M | L | N | I need to: |
|---|---|---|---|---|
| _ | _ | _ | _ | Know more about my own abilities. |
| _ | _ | _ | _ | Be able to take more responsibility for my own actions. |
| _ | _ | _ | _ | Learn how to make decisions. |
| _ | _ | _ | _ | Know more about occupational opportunities in my own community. |
| _ | _ | _ | _ | Learn how to explore occupational areas not available in my community. |
| _ | _ | _ | _ | Learn how to get along better with my peers. |
| _ | _ | _ | _ | Know more about my interests and aptitudes. |
| _ | _ | _ | _ | Know how my interests relate to work. |
| _ | _ | _ | _ | Know how my aptitudes relate to work. |
| _ | _ | _ | _ | Understand what I can realistically achieve. |
| _ | _ | _ | _ | Learn more about how to develop career plans. |
| _ | _ | _ | _ | Find courses which are appropriate to my needs. |
| _ | _ | _ | _ | Learn more about different ways to use leisure time. |
| _ | _ | _ | _ | Be able to choose leisure activities that fulfill my own needs. |
| _ | _ | _ | _ | See the relationship between work and leisure. |
| _ | _ | _ | _ | Know where to go for various kinds of information and assistance. |
| _ | _ | _ | _ | Be able to choose resources that will be of greatest use to me. |
| _ | _ | _ | _ | Know how the courses I am taking relate to my career planning. |
| _ | _ | _ | _ | Have help in learning to obtain jobs. |
| _ | _ | _ | _ | Have someone assist me in getting a part-time or full-time job. |
| _ | _ | _ | _ | Improve the relationships with adults in my life. |
| _ | _ | _ | _ | Learn how to express my feelings to other people. |
| _ | _ | _ | _ | Talk to someone about my interests and plans. |
| _ | _ | _ | _ | Be more accepting of myself and others. |
| _ | _ | _ | _ | Learn how to set goals for myself and evaluate the outcomes. |
| _ | _ | _ | _ | Learn to adapt to change. |
| _ | _ | _ | _ | Learn how my values and attitudes affect my career development. |
|  |  |  |  | Additional Statements: |
| _ | _ | _ | _ |  |
| _ | _ | _ | _ |  |

## HUMAN RELATIONS

## UNIT 2

## ASSIGNMENT SHEET #3: Personality Rating Scale

You will profit from this exercise only to the extent that you give it your careful consideration.

| Trait | Rating (Check) | | | | |
|---|---|---|---|---|---|
| | Excellent | Good | Average | Poor | Very Poor |
| Ambition | | | | | |
| Cooperation | | | | | |
| Courtesy | | | | | |
| Dependability | | | | | |
| Enthusiasm | | | | | |
| Foresight | | | | | |
| Friendliness | | | | | |
| Mental Health | | | | | |
| Honesty | | | | | |
| Industry | | | | | |
| Initiative | | | | | |
| Loyalty | | | | | |
| Neatness | | | | | |
| Poise | | | | | |
| Punctuality | | | | | |
| Self-control | | | | | |
| Sense of Humor | | | | | |
| Tact | | | | | |
| Willingness to Work | | | | | |
| Efficiency | | | | | |
| Persistance | | | | | |

## HUMAN RELATIONS

## UNIT 2

## ASSIGNMENT SHEET #4: Attitude Inventory

Read each of the following questions and answer honestly. A careful study of your answers can help you see the areas that need imporvement. In the blank space provided, write the number that represents your answer in this matter: 5 = postively yes; 4 = mostly yes; 3 = undecided; 2 = mostly no; 1 = postively no. Answer with your first reaction.

_____ 1. Do you make friends easily?

_____ 2. Do you refrain from being a complainer?

_____ 3. Are you careful never to interrupt when other persons are speaking?

_____ 4. Can you be optimistic when others are depressed?

_____ 5. Do you refrain from boasting or bragging?

_____ 6. Do you control your temper?

_____ 7. Are you genuinely interested in the other person's point of view?

_____ 8. Do you speak well of your employer?

_____ 9. Do you keep the same friends for years?

_____10. Do you feel well most of the time?

_____11. Do you use proper English?

_____12. Do you keep promises?

_____13. Are you at ease with the opposite sex?

_____14. Do you have good table manners?

_____15. Do you organize your work and keep up with it?

_____16. Do you get along well with your parents?

_____17. Do you readily admit your mistakes?

_____18. Can you be a leader without being "bossy?"

_____20. Can you stick to a tiresome task without being "prodded?"

_____21. Do you finish each task you begin?

_____22. Do you realize your weaknesses and attempt to correct them?

_____23. Can you take being teased?

_____24. Do you avoid feeling sorry for yourself?

_____25. Are you courteous to your fellow workers?

_____26. Are you usually well groomed and neatly dressed?

_____27. Are you a good loser?

_____28. Do you enjoy a joke even when it is on you?

## ASSIGNMENT SHEET #4: Attitude Inventory

_____29. Do you like children?

_____30 Do you keep your own room in good order?

_____31. Are you aware of the rules of etiquette?

_____32. Do you refrain from giving alibis?

_____33. Are you tolerant of other people's beliefs?

_____34. Do you respect the opinions of your parents?

_____35. Do you introduce people with ease and correctly?

_____36. Do you refrain from pouting when things go differently than you like?

_____37. Are you a good listener?

_____38. Can you speak before a group without feeling self-conscious?

_____39. Do you like to attend parties?

_____40. Are you the kind of friend you expect others to be?

_____41. Do you accept compliment or gifts graciously?

_____42. Can you disagree without being disagreeable?

_____43. Do you like to give parties?

_____44. Are you "on time" for engagements?

_____45. Do you generally speak well of other people?

_____46. Can you take criticism without being resentful or feeling hurt?

_____47. Are you careful to pay back all loans, however small?

_____48. Are you always on time for your appointments?

_____49. Does your voice usually sound cheerful?

_____50. Can you work well with those you dislike?

_____51. Do you contribute to the conversation at the family dinner table?

_____52. Do you try as hard to get along well with your family as with friends?

_____53. Do you like people who are much older than you?

_____54. Are you pleasant to others even when you feel "out of sorts?"

_____55. Are you free from prejudices?

## HUMAN RELATIONS

## UNIT 2

## STUDENT HANDOUT #1: Developing Self-Concept

You are judged by:

### The Way You Look

1. Posture, stature, features, color and texture of hair, teeth, and other physical traits. An appealing personality is not dependent on a particular combination of physical traits.
2. Your grooming - cleanliness, neatness, etc., as well as suitability and good taste in selection of clothing.
3. Facial expression.

### The Way You Talk

1. Use of correct grammar and an adequate vocabulary so that you can think and talk expressively.
2. Use of good taste, courtesy, and good manner in conversation is important. Avoid offending or embarrassing others. Maintain a good humored sincere attitude.
3. Saying clearly and briefly what you have to say in a simple, natural, and friendly manner.
4. Recognizing the time to stop.
5. Graceful admission of lack of knowledge.
6. Use of a cheerful, lively, warm tone of voice with clear enunciation.
7. Respect the opinion of others - but you are not bound to agree.

### The Way You Listen

1. Concentrate, digest, evaluate.
2. How you listen determines the way you respond or react.
3. Avoid showing disagreement in your facial expression and manner. (When you feel that you wish to express a differing opinion, say it honestly but in a good-humored manner. Do not be drawn into an argument.)
4. Resist listening in on nearby conversations.

### The Way You Act Physically

1. Good physical health reflects in the way you act.
2. Consider your physical grace, poise, your stride, and carriage.

# STUDENT HANDOUT #1: Developing Self-Concept

## The Way You Act Emotionally

1. Ability to maintain at all times a normal emotional balance, avoiding a stolid dull manner on the one hand and hysterical behavior on the other.
2. There is no reason why we should not express our emotions if the expression is socially acceptable. People are intended to laugh, cry, be happy or sorrowful, to feel and express righteous indignation, to like some things, and dislike others, to experience sympathy, love, revulsion, awe, and reverence.
3. Emotions should not rule us - we must always be under the control of our will.

## The Way You Act Intellectually

1. The ability to reason from facts to conclusions without allowing prejudice, tradition, or wishful thinking to influence you. Think with brains instead of emotions.
2. Utilize your potential for acquiring knowledge - be mentally alert.
3. Be aware of the complexities of your job; understand personal relationships involved in it; be resourceful in meeting new and difficult situations. Know the value of time - put first things first.

## Your Philosophy of Life

1. Includes your code of personal ethics and morality, your concept of the fundamental values in life, and in the broader meaning of the term, your spiritual development.
2. Good character is a fundamental element in an attractive personality.

## Your Versatility

1. The number and variety of socially acceptable activities in which you engage is a means of developing personality.

## Your Willingness to Help Others

1. Willingness to help others is the mark of a good personality. It creates and retains goodwill. It builds character.

## STUDENT HANDOUT #2: Twenty Personality Factors

### HOW TO DETERMINE THE STRONG AND THE WEAK POINTS IN YOUR PERSONALITY

There are twenty traits without which, though you may have plenty of ability, brains, skill, and information, you can hardly expect to succeed in competion with other people. Here are questions to ask yourself about each trait.

1. AMBITION

Have you the will to improve yourself? This means real will; not merely a vague, intermittent desire. If this guide points out certain important defects, will you take energetic steps to remedy them?

2. INDUSTRIOUSNESS

Have you the ability to drive yourself steadily? Do you hold yourself to the faithful performance of tasks that are distasteful?

3. PERSISTENCE AND PATIENCE

Look back over the various plans you have made during the past years; enumerate all you can remember, and see how many of them you have actually completed.

4. DEPENDABILITY

Can you be relied upon to carry out plans assigned to you by other people? How many times in the past month have you failed to get work done within the period of time in which it should have been done?

5. FORCEFULNESS

Do you give people the impression that you are capable and self-controlled? Are you self-reliant? You will find out a good deal about how you will stand in these things by your ratings on: (6) effectiveness of speech; (7) self-confidence; (12) iniriative, resourcefulness; (13) sensitiveness to criticism.

6. EFFECTIVENESS OF SPEECH

Can you express your ideas clearly and convincingly? Do you speak with a "piping" voice, or have you studied how to place your voice so that you are not unpleasant to listen to?

7. SELF-CONFIDENCE

What are the things you have done of which you have a right to be proud? Think postively at all times. Become genuinely interested in other people.

8. FRIENDLINESS

Are you too critical in your judgmemt of other people? Make a list of six people whom you dislike, and analyze impartially your reasons for disliking them. Have you been acting justly?

## STUDENT HANDOUT #2: Twenty Personality Factors

### 9. ADAPTABILITY

Do you find it easy to listen to what other people are saying? Are you keen to ask questions when people bring up new subjects or business plans? If so, you may be strong in this attribute. But if you are hardly able to wait for a chance to air your opinion, you need to cultivate this trait.

### 10. TACT

Can you work in harmony with other people? Do other people like to be with you? Do you know an individual who especially likes to be given credit for work he/she does? Do you give credit to the individual or do you like to him/her think that you, or someone else, deserves the credit, because you suggested the idea which was carried out, or because you gave assistance in some other way? How often do you find yourself praising people for what they have done?

### 11. CHEERFULNESS

Do you depress other people, or are you a cheerful companion? When your affairs are not going well, can you keep from showing it in your manner? When other people tell you of their plans and hopes, do you take an enthusiastic interest in their affairs, or are you bored and unresponsive?

### 12. GOOD JUDGEMENT

Examine yourself particularly as regards initiative and resourcefulness. How many suggestions have you made to your employer in the past six months How many of these ideas have been approved? If you are given work to do and you run into some difficulty, do you always go to your supervisor for advise, or do you solve the difficulty yourself? Are you sometimes able to see half a dozen ways of solving any one the problems that come up in connection with your work?

### 13. SENSITIVENESS TO CRITICISM

How do you take the criticisms, direct or implied, from employer, friends, and associates? If you brood over them, if the sting of criticism keeps you from seeing that it may be useful, you may be over-sensitive.

### 14. ABILITY TO SIZE UP PEOPLE

Do you see only good in some people and only weaknesses in others? When you discover weaknesses in people, does this keep you from seeing their strong points? Are you observing enough to be able, after talking with a new aquaintance for fifteen minutes, to specify how the individual impressed you concerning the following traits on this guide: neatness of dress, effectiveness of speech, friendliness, tact, and cheerfulness?

## STUDENT HANDOUT #2: Twenty Personality Factors

15. MEMORY

Are you good at remembering names, faces, and personal incidents about the people you meet?

16. NEATNESS

Are you painstaking in regard to your personal appearance?

17. HEALTH HABITS

This is not a matter of your endowment of physical health. Severe illness may not mean that you are short in this trait. Ask yourself whether your habits are those that make for or against good health, and how they tell on your working ability and mental attitude day by day.

18. DISCRIMINATION

Can you discriminate between more important and less important matters? Do you clog your daily routine with unnecessary work on comparatively unimportant details? Have you realized the importance of putting aside work and personal problems when it comes time to relax and rest?

19. ECONOMY

Do you save time and effort by doing things in the right and easiest way without waste motion?

20. CAPACITY TO DELEGATE WORK

This quality is especially important for those who are, or hope to become executives. Executives often fall short in this trait because they lack persistence of a certain kind or because of vanity or selfishness.

# HUMAN RELATIONS

## UNIT 2

## TEST

1. Define the following terms:
    a. Aptitude -
    b. Ability -
    c. Ambition -
    d. Values -
    e. Self-image -
2. List six factors for an individual to consider in self-evaluation for work.

# HUMAN RELATIONS

## UNIT 2

## TEST

1. a. Aptitude - A natural talent which makes it easier to do a given activity.

   b. Ability - Able and skillful to do a given task.

   c. Ambition - The real will to imporove yourself.

   d. Values - What is important to each individual.

   e. Self-image - The feelings one has about oneself.

2. Any six of the following:

   Previous jobs
   Preference of the worker
   Work skills
   Educational qualifications
   Real interests
   Special talents
   Physical condition
   Job wants

# HUMAN RELATIONS

## UNIT 3

## APPLYING FOR A JOB

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to find job openings, identify terms associated with job-hunting, and job descriptions. Students will be able to write a letter of application, prepare a resume, and prepare a follow-up letter. This objective will be considered achieved upon successful performance of the jobs assigned and a score of eighty-five percent or better on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Name four major sources of job-opening leads.

2. Match terms associated with job application to their definitions.

3. Name three methods of applying for a job.

4. Identify items that may appear on a job application as opposed to terms that never appear.

5. Select seven personal attributes or attitudes that a prospective employer is most likely to look for.

6. Identify ten examples of proper conduct during an interview.

7. Write a letter of application according to given standards, using the proper sequence of persuasion, placing emphasis for attention, and emphasis for lasting impression in the most effective places.

8. Apply for a job by phone.

9. Prepare their own resumes, according to given standards, using proper sequence.

10. Write an interview follow-up letter according to given standards.

11. Fill out a given application form.

12. Conduct themselves satisfactorily in a simulated job interview.

# HUMAN RELATIONS

## UNIT 3

## SUGGESTED ACTIVITIES

Instructor:

1. Provide Students with Objective Sheet
2. Provide Students with Information, Assignment, and Handout Sheets
3. Discuss Terminal and Specific Objectives
4. Discuss Information, Assignment, and Handout Sheets
5. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Complete Assignment Sheets and Turn into Instructor
4. Demonstrate the Ability to Accomplish the Procedures Outlined in the Handout Sheets
5. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Assignment Sheets:
    - #1 - Write a Letter of Application
    - #2 - Apply for a Job Interview by Phone
    - #3 - Prepare a Resume
    - #4 - Write an Interview Follow-up Letter
    - #5 - Fill out an Application Form
    - #6 - A Simulated Job Interview
4. Student Handouts:
    - #1 - Application for Employment
    - #2 - Dear Job Applicant
    - #3 - Sample Letter of Application
    - #4 - Sample Resume
    - #5 - Sample Follow-up Letter

## SUGGESTED ACTIVITIES

5. Test
6. Answers to Test

References:

1. Blackledge, Blackledge, Keily, You and Your Job. South-Western Publishing Co., Dallas, Texas: 1967.
2. Grady Kimbrell, Ben S. Vineyard, Succeeding in the World of Work. McKnight Publishing Company, Bloomington, Illinois, 2nd Edition, 1975.

## HUMAN RELATIONS

## UNIT 3

## INFORMATION SHEET

I. Terms and Definitions

   A. Extra-curricular activities - The clubs, organizations, and social or church groups in which you participate.

   B. Fringe benefits - The extras provided by an employer such as paid vacation, sick leave, and insurance protection.

   C. Qualifications - The experience, education, and physical characteristics which suit a person to a job.

   D. Resume - (Personal Data Sheet). A brief typed or printed summary of your qualifications and experience that is used in applying for a job.

II. Sources of Information about Job Openings

   A. Classified ads

      1. Newspapers (local and out-of-town)

      2. Magazines

      3. Yellow Pages of telephone directories

   B. Employment Offices

      1. Government Employment offices

      2. Civil Service Commission

      3. Private Personnel Offices

      4. Proprietors of small businesses

   C. Local Labor Union Business Office

   D. School Officials

      1. Your teachers

      2. Your counselor

      3. Your principal

   E. Friends and Relatives

III. Methods of Applying for a Job

   A. By letter

   B. By phone

   C. In person

IV. Information That May be Asked for on Company Applications (Student Handout 1)

   A. Name and address

   B. Phone number

## INFORMATION SHEET

C. Social Security Number
D. Personal Information
    1. Age
    2. Sex
    3. Height
    4. Weight
    5. Physical Limitations
    6. Draft, or Military status
E. Education
    1. Elementary
    2. High School
    3. College
    4. Other
F. Experience (including Military)
G. Nearest relatives
H. Previous employers (most recent first)
I. Reason for leaving last job
J. Type of job for which one is applying
K. Business or professional references
L. Resume

V. Personal Attributes or Attitudes that Employers Look for Most
    A. Enthusiasm and interest
    B. Dedication and dependability
    C. Alertness, quickness of mind
    D. Honesty and integrity
    E. Desire to work
    F. Desire to help others
    G. Desire to improve one's self

VI. Proper Conduct Before and During the Interview
    A. Go alone - do not take a friend
    B. Check your appearance
        1. Dress neatly
        2. Hair cut and combed or styled
        3. Clean, bathed
        4. Clean shaved
        5. Shoes polished

## INFORMATION SHEET

C. Arrive five minutes early

D. Greet interviewer with a warm smile

E. Call interviewer by name (Mr., Mrs., or Miss Jones)

F. Introduce yourself

G. Shake interviewer's hand only if he offers it, and grasp it firmly

H. Be seated only after interviewer has asked you to do so

I. Sit and stand erect; do not lean against the wall, a chair, or the desk

J. Do not put your hat or coat on the interviewer's desk.

K. Let the interviewer take the lead in the conversation

L. Answer questions completely

M. Be polite and courteous

   1. Do not interrupt
   2. Say "Yes, sir" or "No, sir "

N. Have resume and examples of work available for quick reference.

O. Make an effort to express yourself clearly and distinctly.

   1. Take time to think every answer out
   2. Use proper grammar
   3. Do not swear
   4. Avoid the use of slang words
   5. Try to understand the interviewer's point of view
   6. Look the interviewer in the eye

P. Be sincere and enthusiastic

Q. Avoid irritating or distracting habits such as smoking, chewing gum, eating candy, giggling, squirming in your chair, finger tapping, swinging a crossed leg, reading papers on his or her desk, etc.

R. Don't try to flatter the interviewer

S. Tell the truth about your qualifications and experiences

T. Speak well of former employers and associates

U. Be positive

V. Accept competition gracefully

W. Watch for a sign that the interview is over

X. Thank the interviewer for his time

Y. Leave promptly at the completion of the interview

## V11. Writing a Letter of Application (Student Handout 3)

A. Make sure the letter meets the standards below:

1. Typed
2. Attractive form
3. Logical arrangement of information
4. Free from smudges or typographical errors
5. Free from spelling or grammatical errors
6. Brief and to the point - leave the details for the resume
7. Positive in tone
8. Clearly expressed ideas
9. Signed

B. The following information should be included in a letter of application:

1. Tell where or from whom you learned about the position
2. Type of position for which one is applying
3. Reason interested in position and firm
4. How one's training meets the qualifications for the position
5. Explanation of personal qualifications
6. Mention of resume and of references
7. Request for interview at the employer's convenience
8. Give the phone number where you may be reached

C. Special application-letter techniques

1. Use the "sequence of persuasion"

a. First, you must catch the prospective employer's attention, so in your first paragraph say something that you sincerely think makes you especially worthy of his attention. Warning: in trying to show how you are different, don't try to be cute, or overly clever. Just stating something that shows you appreciate his needs, sincerely, will get his attention; most applicants are most interested in themselves.

**EXAMPLE**

**Step 1 - Attention**

**Dear Mr. Jones:**

**In your search for a helper at the Hilton Nursery, you must want a person who not only knows something about horticulture, but who also is a hard worker who wants to get ahead**

b. Secondly, you must keep his interest in you, Make a smooth transition from your "attention-getter" to some statement that goes more deeply into what you hoped would catch his attention, and usually you can be sure that his interest in you will build.

c. Thirdly, you must say something that will convince the prospective employer that you are worth the attention and interest he has given you thus far as he reads your letter. Usually, a specific example of your qualifications will be most effective. Don't be afraid to allow someone else to say something good about you. Create conviction.

d. Fourthly, and finally, make it as easy as possible on the part of the prospective employer to go into action on your behalf. This means that he has to know, right at this point in your letter (or phone conversation, or resume) where and when he can get in touch with you, with the people whose names you have given as reference, and how to find out more specifically about all qualifications.

**Step 2 - Interest**

I have taken 1,080 class hours in horticulture in Southwest High School, and received high grades in both greenhouse and written work, but in addition you should know that I have worked at many jobs for my parents, the FFA, and garden clubs. I do know how to start and finish a job that is given to me.

**Step 3 - Conviction**

In fact, Mr. Grant, my FFA advisor, suggested that I accept the chairmanship of the BOAC committee whose project was to beautify the city park since I had been active in our chapter horticulture activities.

**Step 4 - Action**

You'll find my resume enclosed so that you can find out more about my background and experience. I look forward to having the opportunity of an interview with you at your convenience. Mail will reach me at the above address, and my phone number is 123-4567, and you could reach me any day after 3 p.m.

Sincerely yours,

John H. Doe

2. How to emphasize to gain attention

a. Some of your qualifications will attract the attention of a prospective employer if you emphasize them by positioning them effectively (for example, honors, awards, unusual experience.)

b. Information occurring at the beginning of a communication unit (i.e.,a sentence, paragraph, total letter, total resume) tends to catch attention. Therefore, you may emphasize things for the purpose of catching attention by positioning them near the beginning of a communications unit (See Step 1).

3. How to emphasize what you want to be remembered

a. Some of your qualifications will be the ones you wish your prospective employer to remember the most about you (for example, a fact that proves you are a good worker, special special knowledge or skills that other applicants aren't likely to have).

## INFORMATION SHEET

4. Education
    a. Schools attended
    b. Dates of attendance
    c. Major field of study
    d. Awards and activities
5. Skills - you have aquired
6. Experience
    a. Name and address of company
    b. Length of time worked
    c. Brief description of duties and responsibilities
    d. Special training programs or courses
7. References (usually three)

    (NOTE: Be sure to obtain permission before naming someone as a reference.)
8. Don't leave unexplained blank periods of time in resume

X. Writing a Follow-up Letter (Student Handout 5)

A. Make sure your letter meets the following standards
1. Typed
2. Error free
3. Clean, neat,and arranged attractively
4. Free from spelling, punctuation, and grammatical errors
5. Sent within a day or two after the interview

B. Points to include in a follow-up letter
1. An expression of appreciation for the interviewer's time and interest
2. A summary of your qualifications and interest in the position
3. Repeat of the emphasis you put in your application letter and resume, plus new emphasis that seems wise after the interview

    (NOTE: Make this last bid for the job a prime example of your excellent work habits. Make the letter as clean, neat, and well-groomed as possible.)

## INFORMATION SHEET

VIII. Making an Appointment by Phone

A. **Steps to follow in making an appointment**

1. Plan what to say before calling
   a. Place emphasis you wish to make
   b. It is wise to write out a rough outline of what you want to cover before you start
2. State one's name and reason for calling

   (NOTE: Remember that the receptionist is there to help you. Keep her on your side.)
3. Ask when would be the best time to come for an interview

   (NOTE: Do not ask over the phone how much the job pays.)
4. Record the day, time and place of the interview
5. Thank the receptionist for her help and talk clearly and distinctly

   (NOTE: Be polite and courteous, talking clearly and distinctly. Remember this is your first contact with the firm. Make the first impression a good one.)

IX. Preparing a Resume (Student Handout 4)

A. Standards for a resume

1. Logically organized
2. Neatly typed
3. Error free
4. In outline form
5. Limited to one page, if possible
6. Honest listing of qualifications and experience
7. Emphasize your best qualifications by placement and organization

B. Information to include in a resume

1. Name, address, and phone number
2. Recent photograph (optional)
3. Personal data
   a. Birth date
   b. Age, height, and weight
   c. Physical limitations
   d. Marital status
   e. Hobbies, if they may have relevance to job

## HUMAN RELATIONS

## UNIT 3

## ASSIGNMENT SHEET #1: Write a Letter of Application.

I. Do the following:

   A. On a separate sheet of paper, write a letter of application to a prospective employer. Use the sample letter in Handout 3 as a guide in composing the letter

   B. Make sure the letter meets the standards outlined in the Information Sheet

# HUMAN RELATIONS

## UNIT 3

## ASSIGNMENT SHEET #2: Prepare a Resume.

I. Do the following:

   A. On a separate sheet of paper write a resume to be included with a letter of application. Use the example in Handout 4 as a guide

   B. Make sure this resume meets the standards outlined in the Information Sheet

# HUMAN RELATIONS

## UNIT 3

## ASSIGNMENT SHEET #3: Apply for an Interview by Phone.

I. Do the following:

A. Under the direction of the instructor, you and another student take turns being applicant and employer, wherein the applicant talks as if over the phone to the employer, applying for an interview about a particular job.

B. The applicant should be judged by the instructor and the student acting the role of the employer.

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# HUMAN RELATIONS

## UNIT 3

## ASSIGNMENT SHEET #4: Write a follow-up Letter.

I. Do the following:

  A. On a separate sheet of paper write a follow-up letter to the prospective employer used in Assignment Sheet #1. Use the sample letter in Handout 5 as a guide in composing the letter.

  B. Make sure this letter meets the standards outline in the Information Sheet.

# HUMAN RELATIONS

## UNIT 3

## ASSIGNMENT SHEET #5: Complete an Application for Employment.

I. Do the following:

A. On a separate sheet of paper fill in the information asked for in Handout 1, being as honest and realistic as possible.

# HUMAN RELATIONS

## UNIT 3

## ASSIGNMENT SHEET #6: Simulated Job Interview.

I. Simulate a Job Interview in Class.

  A. Instructor will organize and evaluate.

*STUDENT HANDOUT 1:* Sample Application Form

# APPLICATION FOR EMPLOYMENT

## PERSONAL INFORMATION

DATE SOCIAL SECURITY NUMBER

NAME LAST FIRST MIDDLE AGE SEX

PRESENT ADDRESS STREET CITY STATE ZIP

PERMANENT ADDRESS STREET CITY STATE ZIP

PHONE NO. OWN HOME RENT BOARD

DATE OF BIRTH HEIGHT WEIGHT COLOR OF HAIR COLOR OF EYES

MARRIED SINGLE WIDOWED DIVORCED SEPARATED

NUMBER OF CHILDREN DEPENDENTS OTHER THAN WIFE OR CHILDREN CITIZEN OF U. S. A. YES ○ NO ○

IF RELATED TO ANYONE IN OUR EMPLOY, STATE NAME AND DEPARTMENT REFERRED BY

## EMPLOYMENT DESIRED

POSITION DATE YOU CAN START SALARY DESIRED

ARE YOU EMPLOYED NOW? IF SO MAY WE INQUIRE OF YOUR PRESENT EMPLOYER

EVER APPLIED TO THIS COMPANY BEFORE? WHERE WHEN

LAST

FIRST

MIDDLE

| EDUCATION | NAME AND LOCATION OF SCHOOL | YEARS ATTENDED | DATE GRADUATED | SUBJECTS STUDIED |
|---|---|---|---|---|
| GRAMMAR SCHOOL | | | | |
| HIGH SCHOOL | | | | |
| COLLEGE | | | | |
| TRADE, BUSINESS OR CORRESPONDENCE SCHOOL | | | | |

SUBJECTS OF SPECIAL STUDY OR RESEARCH WORK

WHAT FOREIGN LANGUAGES DO YOU SPEAK FLUENTLY? READ WRITE

U. S. MILITARY OR NAVAL SERVICE RANK PRESENT MEMBERSHIP IN NATIONAL GUARD OR RESERVES

ACTIVITIES OTHER THAN RELIGIOUS (CIVIC, ATHLETIC, FRATERNAL, ETC.)

EXCLUDE ORGANIZATIONS THE NAME OR CHARACTER OF WHICH INDICATES THE RACE, CREED, COLOR OR NATIONAL ORIGIN OF ITS MEMBERS.

(CONTINUED ON OTHER SIDE)

## FORMER EMPLOYERS (LIST BELOW LAST FOUR EMPLOYERS, STARTING WITH LAST ONE FIRST.)

| DATE MONTH AND YEAR | NAME AND ADDRESS OF EMPLOYER | SALARY | POSITION | REASON FOR LEAVING |
|---|---|---|---|---|
| FROM | | | | |
| TO | | | | |
| FROM | | | | |
| TO | | | | |
| FROM | | | | |
| TO | | | | |
| FROM | | | | |
| TO | | | | |

## REFERENCES: GIVE BELOW THE NAMES OF THREE PERSONS NOT RELATED TO YOU, WHOM YOU HAVE KNOWN AT LEAST ONE YEAR.

| | NAME | ADDRESS | BUSINESS | YEARS ACQUAINTED |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |

## PHYSICAL RECORD:

LIST ANY PHYSICAL DEFECTS

WERE YOU EVER INJURED? GIVE DETAILS

HAVE YOU ANY DEFECTS IN HEARING? IN VISION? IN SPEECH?

IN CASE OF EMERGENCY NOTIFY

NAME ADDRESS PHONE NO.

I AUTHORIZE INVESTIGATION OF ALL STATEMENTS CONTAINED IN THIS APPLICATION. I UNDERSTAND THAT MISREPRESENTATION OR OMISSION OF FACTS CALLED FOR IS CAUSE FOR DISMISSAL. FURTHER, I UNDERSTAND AND AGREE THAT MY EMPLOYMENT IS FOR NO DEFINITE PERIOD AND MAY, REGARDLESS OF THE DATE OF PAYMENT OF MY WAGES AND SALARY, BE TERMINATED AT ANY TIME WITHOUT ANY PREVIOUS NOTICE.

DATE SIGNATURE

---

### DO NOT WRITE BELOW THIS LINE

INTERVIEWED BY DATE

## REMARKS:

| | | | |
|---|---|---|---|
| NEATNESS | | CHARACTER | |
| PERSONALITY | | ABILITY | |

HIRED FOR DEPT. POSITION WILL REPORT SALARY WAGES

APPROVED: 1. EMPLOYMENT MANAGER 2. DEPT. HEAD 3. GENERAL MANAGER

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## *STUDENT HANDOUT 2:* "Dear Job Applicant"

### PROSPECTIVE EMPLOYERS OF AMERICA

Dear Job Applicant:

Today you asked me for a job. From the look of your shoulders as you walked out, I suspect you've been turned down before, and maybe you believe by now that people just out of high school can't find work.

But I did hire a teen-ager today. You saw him. He was the one with the polished shoes and a necktie. What was so special about him? Not experience; neither of you had any. It was his attitude. Yes, attitude! He wanted that job badly enough to look neat, and to look in the phone book to find out what this company does. He did his best to impress me. That's how he edged you out.

You see, people who hire people aren't "with" a lot of things. Some of us have what you may call Stone Age ideas about who owes whom a living. But there's nothing wrong with the checks we sign, and if you want one, you'd better tune in to our wave-length, too.

Ever hear of "empathy"? It's the trick of seeing the other fellow's side of things. I couldn't have cared less that you're behind in your car payments. That's your problem. What I needed was someone who'd go out into the plant, keep his eyes open, and work for me as if he were working for himself. If you have even the vaguest idea of what I'm trying to say, let it show the next time you ask for a job. You'll be head and shoulders over the rest.

Look, the only time jobs grew on trees was while most of the manpower was wearing GI's and pulling KP. For all the rest of history, you got a job in the same way you got a girl. You'd have to case the situation, wear a clean shirt, and try to appear reasonably willing. Maybe jobs aren't as plentiful right now as you'd like, but a lot of us can remember when master craftsmen were walking the streets. By comparison, you don't know the meaning of "scarce."

You may not believe it, but all around you are employers looking for young men and women smart enough to go after a job in the old-fashioned way. When they find one, they can't wait to unload some of their worries on him.

For both our sakes, *get eager*, will you?

Sincerely yours,

P. Employer

Prospective Employer

# STUDENT HANDOUT 3: Application Letter.

John H. Doe
8910 Alpha Street
Anywhere, U.S.A.

Mr. John Jones, Personnel Director
The Horton Nursery
Box 19
Anywhere, U.S.A.  11212

Dear Mr. Jones:

In your search for a helper at the Horton Nursery, you must want a person who not only knows something about horticulture, but who is also a hard worker who wants to get ahead.

I have taken 1,080 class and lab hours in horticulture at East Mesa High School, and received high grades in both the greenhouse and written work. But in addition, you should know that I have worked at several jobs for my parents, the YMCA, and garden clubs. I do know how to start and finish a job that is given to me.

In fact, Mr. Gonzales, our YMCA leader, gave me the job of group leader in the last planting campaign, because (as he said) I had been the best worker on the previous campaign.

You'll find my resume enclosed so that you can find out more exactly about my background and experience. I look forward to haveing the opportunity of an interview with you at your convenience.

Mail will reach me at the above address. My phone number is 123-4567, and you could reach me any day after 3 p.m.

Sincerely yours,

John Doe

## *STUDENT HANDOUT 4:* Sample Resume

A good photo in this spot, if possible.

Name: John H. Doe
Address: 8910 Alpha St., Somewhere, U.S.A., 12111
Telephone: 123-4567
Age: 18
Height: 5'5
Weight: 120
Health: Excellent
Marital Status: Single

Put this first if it tells more why you are qualified than "work experience" does.

Education: Expect to have been graduated from high school, May, 1976.
Subjects Studied: Horticulture I and II (1080 hours)
Algebra – 2 semesters
Drafting
Botany
Student activities: Member of Garden Club
YMCA Park Planting Committee

Put this first if you've had at least 2 summers of actual work experience.

Work Experience: Sisneros Nursery (1974-1975 summer)

References:
Mr. Sisneros
7689 Fourth St.
Somewhere, U.S.A., 11211

Mr. Gonzales
YMCA
4985 Yale St.
Somewhere, U.S.A., 11211

Mr. Jimmie Smith
Youth Director
Park View Baptist Church
Anywhere, U.S.A., 11211

Date compiled June 1, 1999

Signature John Doe

STUDENT HANDOUT 5: Letter of Follow-up

John H. Doe
1987 Fourth Street
Anywhere, U.S.A. 11211

January 1, 1999

Mr. John Jones, Personnel Director
The Horton Nursery
Box 19
Anywhere, U.S.A. 11212

Dear Mr. Jones:

Thank you for interviewing me for the position of helper at The Horton Nursery. I feel that working at The Horton Nursery would be interesting and enjoyable, and that I can do the work that the job requires. I hope I may have the opportunity to prove my worth.

The application blank you gave me is filled out, and I am enclosing it with this letter.

I shall be available for work May 15. You may call me at my home any day after 3 p.m. The number is 123-4567.

Sincerely yours,

John H. Doe

John H. Doe

Enclosed: Filled-out Application Form

## HUMAN RELATIONS

## UNIT 3

## TEST

1. List four means of locating job openings.

2. Match the terms associated with a job application to the correct definition:

   ____ a. Awards
   ____ b. Extra-curricular act activities
   ____ c. Fringe benefits
   ____ d. Qualifications
   ____ e. Resume
   ____ f. Vocational preparation

   (1) A brief typed summary of one's qualifications and experience that is used in applying for a job.
   (2) The extras provided by an employer such as paid vacation, sick leave, and insurance protection.
   (3) Recognition received for outstanding achievement.
   (4) The experience, education, and physical characteristics which suit a person to a job.
   (5) Any vocational courses and skills one has learned in high school or through work experience.
   (6) The clubs, organizations, and social or church groups in which you participated.

3. List three methods of applying for a job.

4. Select ten items of information that may be asked for an employer's application blank.

   ____ a.
   ____ b.
   ____ c.
   ____ d.
   ____ e.
   ____ f.
   ____ g.
   ____ h.
   ____ i.
   ____ j.

   (1) Race
   (2) Name and address
   (3) Phone number
   (4) Shoe size
   (5) Age
   (6) Education
   (7) Number of brothers and sisters
   (8) Experience
   (9) Next of kin
   (10) Make and model of car
   (11) Previous employers
   (12) Reasons for leaving last job
   (13) Are you left or right handed?
   (14) Type of job for which one is applying
   (15) References

5. Select seven personal attributes or attitudes that an employer looks for.

____ a.
____ b.
____ c.
____ d.
____ e.
____ f.
____ g.

(1) Alertness
(2) Long wavy hair
(3) Dedication and dependability
(4) Enthusiasm and interest
(5) New car
(6) Honesty and integrity
(7) Desire to work
(8) Beard
(9) Flashy clothes
(10) Desire to help others
(11) Desire to improve one's self.

6. Identify ten examples of proper conduct during an interview.

____ a.
____ b.
____ c.
____ d.
____ e.
____ f.
____ g.
____ h.
____ i.
____ j.

(1) Arrive five minutes late; gives the impression that one is busy.
(2) Sit and stand erect.
(3) Call interviewer by his or her first name.
(4) Answer questions completely.
(5) Put a hat or coat on the interviewer's desk.
(6) Greet interviewer with a warm smile
(7) Sit down immediately upon entering the room.
(8) Shake the interviewer's hand firmly.
(9) Be polite and courteous.
(10) Use all of the cute slang expressions.
(11) Look the interviewer in the eye.
(12) Be sincere and enthusiastic.
(13) Thank the interviewer for his time.
(14) Chain smoke (gives the impression of being a real "he man.")
(15) Speak well of former employers.
(16) Flatter the interviewer.
(17) Leave promptly at completion of interview.

7. Write a letter of application (ASsignment Sheet 1) to satisfaction of instructor.

8. Apply for a job interview by phone (Assignment Sheet 2) to satisfaction of instructor.

9. Prepare a resume (Assignment Sheet 3) to satisfaction of instructor.

10. Write an interview follow-up letter (Assignment Sheet 4) to satisfaction of instructor

11. Fill out a given application form (Assignment Sheet 5) to satisfaction of instructor.

12. Go through a simulated job interview (Assignment Sheet 6) to satisfaction of instructor.

# HUMAN RELATIONS

## UNIT 3

## ANSWERS TO TEST

1. a. Classified ads
   b. Employment offices
   c. Local labor union business office
   d. School officials

2. a. (3)
   b. (6)
   c. (2)
   d. (4)
   e. (1)
   f. (5)

3. a. Letter
   b. Telephone
   c. In person

4. a. (2)
   b. (3)
   c. (5)
   d. (6)
   e. (8)
   f. (9)
   g. (11)
   h. (12)
   i. (14)
   j. (15)

5. a. (1)
   b. (3)
   c. (4)
   d. (6)
   e. (7)
   f. (10)
   g. (11)

6. a. (2)
   b. (4)
   c. (6)
   d. (8)
   e. (9)
   f. (11)
   g. (12)
   h. (12)
   i. (15)
   j. (17)

7. Complete Assignment Sheet 1 to instructor's satisfaction.

8. Complete Assignment Sheet 2 to instructor's satisfaction.

9. Complete Assignment Sheet 3 to instructor's satisfaction.

10. Complete Assignment Sheet 4 to instructor's satisfaction.

11. Complete Assignment Sheet 5 to instructor's satisfaction.

12. Complete Assignment Sheet 6 to instructor's satisfaction.

# BUSINESS OPERATIONS

## UNIT 1

## FILING TAX FORMS

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to define terms related to income taxes, be able to complete sample short forms (1040A), be able to fill out their own income tax form, and be able to complete Schedule "C" tax form.

### SPECIFIC OBJECTIVES

Upon completion of this unit, students will be able to:

1. Complete questions and/or problems assigned from each chapter of Understanding Taxes as required by the instructor.
2. Complete the Schedule "C" tax form as required by the instructor.

## BUSINESS OPERATIONS

## UNIT 1

## SUGGESTED ACTIVITIES

Instructor:

1. Order Understanding Taxes, student booklets and teacher's manual. To obtain copies write your district director, Internal Revenue Service, Understanding Taxes Coordinator. Order the manuals needed for both the students and the teachers. Also order the Tax Guide for Small Business Publication No. 334. These booklets are free.
2. Provide students with Information booklets on taxes.
3. Provide students with Objective Sheet
4. Discuss Terminal and Specific Objectives
5. Discuss tax information booklets
6. Have students complete the crossword puzzle on taxes
7. Have students complete their own income tax forms
8. Have students complete the Schedule C problem

Students:

1. Read Objectives
2. Study tax information booklets
3. Complete crossword puzzle on taxes
4. Complete own income tax forms (1040 A)
5. Complete problem from Schedule C

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Assignment Sheet
   #1 - Crossword Puzzle on Taxes
   #2 Schedule C Problem
3. Answers to Assignment Sheet
4. Schedule C Instructions
5. Schedule C Form

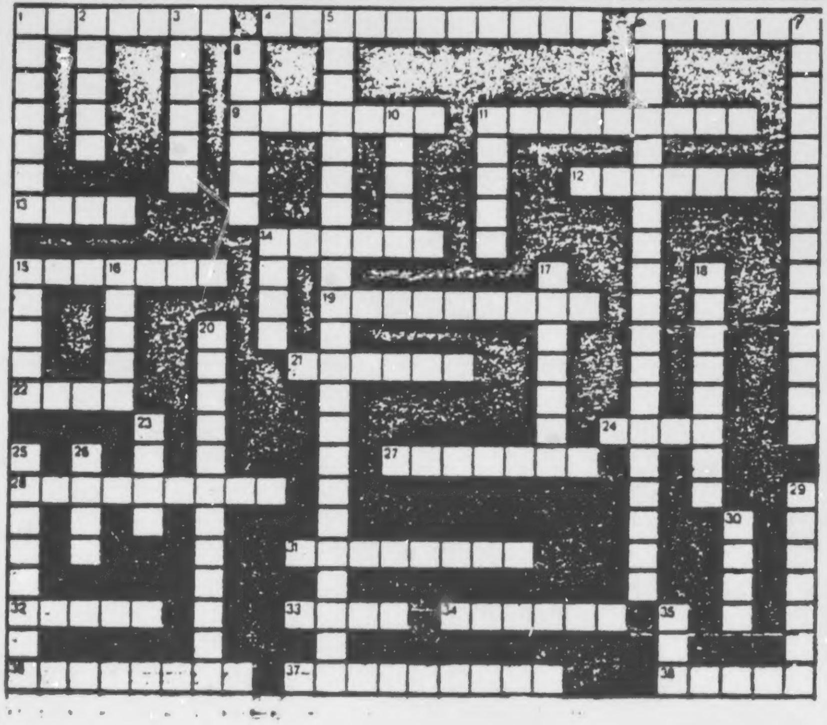
References:

1. Understanding Taxes, student booklet, Internal Revenue Service, New publication each year. (Free upon request from the IRS.)
2. Understanding Taxes, teacher's manual, Internal Revenue Service, New publication each year. (Free upon request from the IRS.)
3. Tax Guide for Small Business, Publication #334, Internal Revenue Service, New updated publication each year. (Free upon request from the IRS.)

# BUSINESS OPERATIONS
## UNIT 1
## ASSIGNMENT SHEET #1: Crossword Puzzle on Taxes

**Word List**

- fiscal year
- exempt
- tax liability
- commission
- withholding tax
- interest
- wage and tax
- tax table
- March
- May
- individual return
- taxable income
- services
- income tax
- IRS
- sales taxes
- Articles of Confederation
- social security number
- revenue
- Customs
- internal taxation
- amendment
- taxpayer
- citizen
- personal
- credits
- joint return
- taxes
- excise
- adjusted gross income
- assess
- Internal Revenue Service
- filing
- Federal
- social security
- sick
- duties
- schedules
- refund
- films
- alien
- sales
- accrual
- form
- exemption
- return
- April
- loss
- rates
- compute
- sign
- amended
- contribution
- itemizing
- Treasury
- gain
- evade
- withheld
- tips
- rent
- tariff
- cash
- dividend
- records
- deduction
- law
- wages



**Across**

1. If you are a U.S.________you are generally required to pay Federal income taxes.
4. A man and his wife may file a _____ (2 words)
6. To charge the taxpayer's account for taxes due.
9. The 16th Ammendment created the ____income tax.
11. In order to determine your tax liability you may report your deductions on one of these.
12. Taxes paid on imports.
13. A taxpayer must itemize deductions to claim a _____ pay exclusion
14. Generally January 1 - April 15 is the _____ period for Federal income tax returns.
15. An accounting method, in which income is accounted for when it is earned, whether or not it has been received; and expenses are deducted when they are incurred rather than when they are paid.
19. A taxpayer is entitled to only one_____ for himself.
21. Every taxpayer must file a Federal income tax________.
22. Generally you may claim a deduction if this occurs in your business.
24. Each taxpayer must remember to ______ his/her return.
27. If you find you have not included all of your income after filing your return, you may file an______return.
28. The process of listing specific tax deductions rather than taking a standard deduction.
31. The Department of the_____is responsible for developing, distributing, and collecting revenues.
32. To willfully seek to avoid paying taxes is to______them.
33. A type of income an employee must report to his employer if it exceeds $20 per month.
34. A list or system of taxes placed by a government upon exports or especially imports.
36. One type of income from ownership of stock.
37. A_____of $750 is allowed for each dependent claimed.
38. The most common form of income received by an employee.

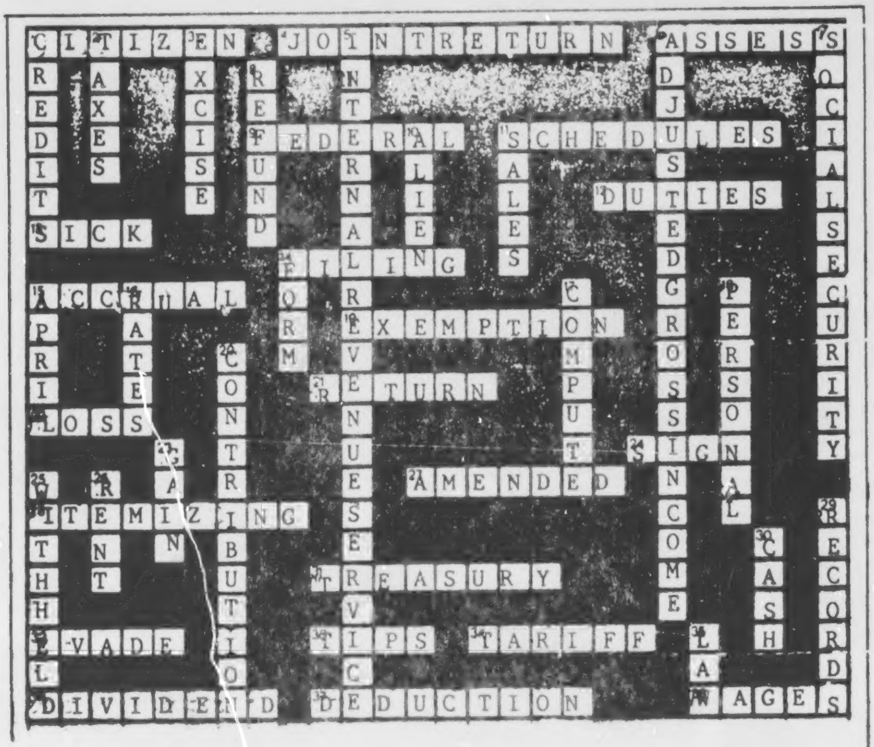
**Down**

1. Estimated tax payments and other_____ are deducted from your tax.
2. ______are what we pay for a civilized society.
3. This tax is imposed on specific items or services.
5. U.S. Government agency responsible for collecting the Government's income taxes. (3 words)
6. You subtract itemized deductions from this figure. (3 words)
7. This number must appear on your return. (2 words)
8. If the amount of tax withheld is larger than taxes due then the taxpaper is entitled to a_____.
10. A person belonging to another country.
11. A tax paid for items we buy is called a_____tax.
14. A taxpayer must use the proper tax _____when filing.
15. The month in which most taxpayers are required to file their return.
16. A percentage used to express the l level of your tax.
17. A taxpayer may_____his taxes by either of two methods.
18. A taxpayer may claim up to three_____ exemptions if blind and over 85.
20. As a taxpayer you are entitled to a deduction for your_____to a church.
23. A net increase in income is a ______.
25. Most taxpayer have their taxes______ by their employers.
26. Income received for the use of your property.
29. Receipts and bills of sales which must be kept by a taxpayer.
30. There is a_____method and accrual method.
35. A citizen is required by_____ to pay his taxes.

BUSINESS OPERATIONS

UNIT 1

ANSWERS TO CROSSWORD PUZZLE


CITIZEN
JOINTRETURN
ASSESS
CREDITS
TAXES
EXCISE
REFUND
INTERNALREVENUESERVICE
FEDERAL
ALIEN
SCHEDULES
SALES
ADJUSTEDGROSSINCOME
SOCIALSECURITY
DUTIES
SICK
FILING
FORM
ACCRUAL
RATE
APRIL
CONTRIBUTION
EXEMPTION
COMPUTE
PERSONAL
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LOSS
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GAIN
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ITEMIZING
RECORDS
CASH
TREASURY
EVADE
TIPS
TARIFF
LAW
DIVIDEND
DEDUCTION
WAGES

# Instructions for Schedule C

## Profit or (Loss) From Business or Profession

If you operated a business or practiced a profession, complete Schedule C. If you had more than one business, or if you and your spouse had separate businesses, please complete a Schedule C for each business.

Farmers should use **Schedule F.**

If some of your expenses are part business and part personal, you may deduct only the business part. For example, if only half of your car usage was for business, deduct only half of the cost of operating the car.

Report sales, exchanges, and involuntary conversions of trade or business property on **Form 4797**, Supplemental Schedule of Gains and Losses.

You must pay social security self-employment tax on income from any trade or business, unless you are specifically excepted. Please see **Schedule SE.**

Report interest, taxes, and casualty losses not related to your business as itemized deductions on **Schedule A.**

### Item A—Main Business Activity and Product

Report the business activity that accounted for the most income included on Schedule C, Part I, line 1a. Give the general field as well as the product or service. For example, "wholesale—groceries" or "retail—hardware."

### Item C—Employer Identification Number

You don't need an employer identification number unless you had a Keogh (H.R. 10) plan or were required to file an employment, excise, or alcohol, tobacco, and firearms tax return.

### Item D—Business Address

Use your home address only if you actually conducted the business from your home. You should show a street address instead of a box number.

### Item E—Accounting Method

You must use the cash method on your return unless you kept account books. If you kept books, you can use the cash method, accrual method, or in some cases, the completed contract or percentage of completion method. The method used must accurately reflect your income.

If you want to change your accounting method (including the treatment of any item such as inventories or bad debts) you must usually first get the permission of the Commissioner of Internal Revenue. File **Form 3115** within the first 180 days of the tax year in which you want to make the change.

If you use the cash method, show all items of taxable income actually or constructively received during the year (in cash, property, or services). Also show amounts actually paid during the year for deductible expenses. Income is constructively received when it is credited to your account or set aside for you to use at any time.

If you use the accrual method, report income when you earn it and deduct expenses when you incur them, even if you do not pay them during the tax year.

### Item F—Valuation Methods

Your inventories can be valued at:

**a.** cost,

**b.** cost or market value, whichever is lower, or

**c.** any other method approved by the Commissioner of Internal Revenue.

You must continue to use the same valuation method you used the first year you took inventory unless you get permission to change your method.

### Item H—Limited Deduction for Losses Arising from Certain Activities

If you are engaged in the activity of:

**a.** holding, producing, or distributing motion picture films or video tapes,

**b.** farming (see the instructions for Schedule F (Form 1040) for a definition of farming),

**c.** leasing section 1245 property (personal property, and certain other tangible property other than buildings, an elevator or escalator, or other real property that is or has been subject to an allowance for depreciation or amortization), or

**d.** exploring for, or exploiting, oil and gas resources,

as a trade or business or for the production of income, any loss from that activity may not exceed the total amount you have at risk (amount that you personally invested plus any amount for which you are personally liable).

You are not considered "at risk" for any amount you borrowed if:

- you borrowed from a relative or someone who has an interest in the business, or
- you are protected against loss by a guarantee, stop-loss agreement or similar arrangement.

If line 34 is a loss, you should enter on Form 1040, line 13, only the amount for which you are considered "at risk."

**Note:** *Enter as a deduction on Schedule C, line 32, any loss from such activity that was incurred in 1977, but not allowed for that year because of the "at risk" limitations.*

### Item I—Deductions for Business Use of a Home

You may deduct, within certain limits, business expenses that apply to a part of your home only if that part is exclusively used on a regular basis:

**a.** as your principal place of business,

**b.** as a place of business used by your patients, clients, or customers in meeting or dealing with you in the normal course of your trade or business, or

**c.** in connection with your trade or business if it is a separate structure that is not attached to your home.

You may also deduct expenses that apply to space within your home that is used on a regular basis to store inventory held for use in your trade or business of selling products at retail or wholesale, but only if your home is the only fixed location of your trade or business.

If you use space in your home on a regular basis in your trade or business of providing day care service, you may be able to deduct the business expenses even though you also use the same space for nonbusiness purposes.

Please get **Publication 587**, Business Use of Your Home, for more information. It will explain how to figure any deduction you may be allowed, including the treatment of taxes, interest, and casualty losses.

See Instructions for **Schedule E** (Form 1040) for information on deductions for rental of a dwelling used as a residence.

**Information Returns.**—You may be required to file information returns for wages paid to employees, certain payments of fees and other non-employee compensation, interest, rents, royalties, annuities, and pensions. For more detailed information, see instructions for **Forms W-3** (Transmittal of Income and Tax Statements) and **1096** (Annual Summary and Transmittal of U.S. Information Returns).

## Part I — Income

## (Lines 1 through 5)

### Line 1a—Gross Receipts or Sales

Enter gross receipts or sales from your business.

**Installment Sales.**—If you use the installment method of reporting sales income, please attach a schedule showing separately for 1978 and the three preceding years: gross sales; cost of goods sold; gross profit; percentage of gross profits to gross sales; amounts collected; and gross profits on amounts collected.

### Line 1b—Returns and Allowances

You should enter on line 1b such items as returned sales, rebates, and allowances from the sales price.

### Line 2—Cost of Goods Sold and/or Operations

**Cost of Goods Sold.**—If you engaged in a trade or business in which the production, purchase, or sale of merchandise was an income-producing factor, merchandise inventories must be taken into account at the beginning and end of your tax year. Enter the amount from Schedule C-1, line 8.

Cost of Operations (Inventories Not an Income-determining Factor). If the amount on line 2 includes the cost of operations,

BUSINESS OPERATIONS

UNIT 1

SCHEDULE C INSTRUCTIONS

**complete the appropriate lines on Schedule C–1.**

### Line 4—Other Income

Include finance reserve income, scrap sales, amounts recovered from bad debts, interest and other kinds of miscellaneous income from the business or profession.

## Part II — Deductions (Lines 6 through 33)

### Line 7—Amortization

You may amortize the cost of pollution-control facilities, on-the-job training, and child care facilities over a 60-month period instead of taking the depreciation deduction.

You may also amortize amounts you paid for research, experiments, and a trademark or trade name over a period of at least 60 months.

**Real property construction period interest and taxes** generally cannot be fully deducted in the year you paid or incurred them. Amounts not allowed as a deduction in the current year must be capitalized and amortized. This rule does not apply to low-income housing.

For more information about construction period interest and taxes and other amounts subject to amortization, please **get Publication 535,** Tax Information on Business Expenses and Operating Losses.

### Line 8—Bad Debts from Sales or Services

Include debts and partial debts arising from sales or services that were included in income and are definitely known to be worthless. Instead of this, you may deduct a reasonable amount that was added during the tax year to a bad debt reserve.

If you later collect a debt that you deducted as a bad debt, include it as income in the year you collect it unless you use the bad debt reserve method. For more information, please get **Publication 548,** Tax Information on Deductions for Bad Debts.

### Line 10—Car and Truck Expenses

You can deduct the actual cost of running your car or truck or take the fixed mileage rate. You must use actual costs if you use more than one car or truck in your business. If you deduct actual cost, show depreciation on line 13.

The fixed rate is figured at 17 cents a mile for the first 15,000 miles and 10 cents for each mile over 15,000. Add to this amount your parking fees and tolls.

For cars that have been or are considered fully depreciated, the fixed mileage rate is 10 cents a mile for all business mileage.

You can change methods of figuring your cost from year to year. But you cannot change to the fixed mileage rate if you claimed depreciation and did not use the straight line method, or if you claimed additional first-year depreciation.

### Line 12—Depletion

If you claim a deduction for timber depletion, please attach **Form T.**

### Line 13—Depreciation

You can deduct a reasonable allowance for the exhaustion, wear and tear, and obsolescence of property used in a trade or business, or property held for the production of income. The allowance does not apply to stock in trade, inventories, land, and personal assets.

You can either list items separately or group similar assets as one item when filling in **Schedule C–2.**

Please see **Form 4562,** Depreciation, for information on depreciation methods, limitations and special rules. **Publication 534,** Tax Information on Depreciation, also contains helpful information.

**Note:** Your total additional first year depreciation deduction from all sources is limited to $2,000 ($4,000 if married filing a joint return).

### Line 15—Employee Benefit Programs

Enter the amount of your contributions that are not an incidental part of a pension or profit-sharing plan included on line 22. Also include here contributions to insurance, health and welfare programs.

### Line 18—Interest on Business Indebtedness

If you paid interest for years after 1978, deduct only the part you paid for 1978.

Don't take a deduction on Schedule C for interest you paid or accrued on debts from buying or carrying investment property. Deduct this interest on Schedule A. For more information, see **Publication 545,** Income Tax Deduction for Interest Expense.

### Line 22—Pension and Profit-sharing Plans

You should enter the amount you claim as a deduction for contributions to a pension, profit-sharing, or annuity plan, or plans, for the benefit of your employees. If the plan includes you as a self-employed person, you should enter contributions made as an employer on your behalf (but not voluntary contributions you made as an employee) on Form 1040, line 25, instead of on Schedule C, line 22.

For filing requirements, please see instructions for Form 1040, line 25, on page 10.

### Line 25—Repairs

You can deduct the cost of repairs, including labor, supplies, and other items that do not add to the value or increase the life of the property. Do not deduct the value of your own labor. And do not deduct amounts you spent to restore or replace property. They are chargeable to capital accounts or to depreciation reserve, depending on how depreciation is charged on your books.

### Line 29—Travel and Entertainment

You can deduct all ordinary and necessary travel and entertainment expenses paid or to fill-in **Schedule C–3** to report expense account information.

### Line 31—Wages

Enter on line 31a the total salaries and wages (other than salaries and wages deducted elsewhere on your return) paid or incurred for the tax year. Do not include any amount paid to yourself.

Enter on line 31b the applicable new jobs credit from Form 5884, line 13. See instruction G of the Instructions for Form 5884 for additional information. For more details, please get **Publication 902,** Tax Information on Jobs Tax Credit.

### Line 32—Other Business Expenses

Include all ordinary and necessary business expenses. Do not include the cost of business equipment or furniture, replacements or permanent improvements to property, or personal living and family expenses.

### Schedule C–3—Expense Account Information

Enter here amounts for which you are claiming a deduction on Schedule C that were:

- amounts other than wages and salaries, received as advances or reimburseme[illegible] and
- amounts you paid for expenses incurred by or for yourself or your employees. Include all amounts charged through any type of credit card, for which you claimed a deduction.

Do not include amounts you paid to buy goods to resell or use in the business. Also, do not include incidental expenses, like bus or taxi fares paid for local errands. Be sure to keep records as proof of amounts spent for entertainment.

**Foreign Conventions.**—Generally, no deduction is allowed for attendance at more than two foreign conventions during your tax year. The amount of expenses you can deduct is also subject to special limitations based on the amount of time actually devoted to business, etc.

In order to deduct any expenses for a foreign convention you must attach both of the following to your tax return for the year in which the expenses are deducted:

**a.** your signed statement indicating the total days of the trip, the days and amounts spent traveling, the number of hours each day devoted to scheduled business activities, a program of the business activities; and

**b.** a written statement, signed by an officer of the organization or group sponsoring the convention, that includes a schedule of business activities for each day of th[illegible] convention and the number of hours of each day such scheduled business activities were attended.

For more information, please get **Publication 463,** Travel, Entertainment, and Gift Expenses.

**Publication 334.**—If you need more information about business income and expenses, get **Publication 334,** Tax Guide

# BUSINESS OPERATIONS

## UNIT 1

## SCHEDULE C INSTRUCTIONS

Sole proprietors report their business income on Schedule C (Form 1040), which is illustrated in the following pages. The explanations below are keyed to corresponding numbers on the sample filled-in Schedule C.

Note that item 16 appears twice on this schedule. As explained, the same key number is used for comparable items appearing on the sample forms. Because number 16 is used for the item "other deductions" on the other sample returns, it is likewise used for "other business expenses" on Schedule C. Similarly, insurance, legal and professional fees, and commission are included with and listed as "other deductions" in all the other sample returns. These items are accordingly keyed as such on Schedule C.

Susan J. Brown owns Milady Fashions, a ladies' ready-to-wear apparel shop. She uses the accrual method of accounting and files her return on a calendar-year basis.

(1) Total sales of $347,742.73 includes merchandise sold on charge accounts. The $1,442.10 reflects refunds and credits for clothes returned during the year. The difference is net sales for 1979.

(2) Schedule C-1 is used to determine the cost of goods sold during the year. Her computation involves only inventories and purchases. Inventory at beginning of year for 1979, $32,843.66, is the same as inventory at end of year for 1978. From total purchases of $241.026.51 she subtracts $774.42, the cost of dresses, etc. The cost of goods sold is net purchases plus beginning inventory less inventory at the end of the year.

If Susan were a manufacturer, she would use the full absorption method to determine the cost of her inventory and include all direct and indirect costs in her cost of goods sold.

(3) Gross profit, $106,951.14, is the difference between the net sales and cost of goods sold.

(4) If Susan had any miscellaneous income from her trade or business, such as income from fashion shows, she would report it on this line. Other income, such as interest from investments or rentals of real estate, is not included on Schedule C, it is shown elsewhere on Form 1040.

(5) The total income on Schedule C is the same as the gross income from the business.

(12) Before she could enter the deduction for depreciation on line 6, she had to compute it in Schedule C-2.

NOTE: The basis used to calculate depreciation for each delivery truck is the cost of each truck less salvage value that has been reduced by 10% of the basis of the truck.

## SCHEDULE C INSTRUCTIONS

(9) The total amount of $2,802.75 includes a business license, property tax on store fixtures, and license tags for the delivery trucks. They also include her share of social security taxes, and State and Federal unemployment taxes paid on her employees' wages.

(7) The store building is leased; she paid rent of $4,800 for 1977.

(8) Counters were refinished and other painting was done at a total cost of $364.00. Repairs and upkeep of her delivery trucks cost $1,410.15. She totaled these expenses and entered the sum on line 9.

(6) The payroll book shows total salary expense of $28,450 for five employees. Susan does not include the amount she draws for her personal use.

(16) The insurance expense of $950 represents the 1979 portion of the premiums on the insurance policies covering her business property.

Legal and professional fees and commissions were not items of expense in Susan Brown's business for 1979.

(13) No amortization or depletion expenses were incurred in 1979.

(14) Susan Brown has made contributions to an H.R. 10 retirement plan, which included coverage for her employees and herself. The bond purchase plan has beem utilized as the funding arrangement; the only investment permitted under this plan is in special United States Government retirement bonds. Susan chose a plan which calls for annual contributions by her totalling 15% of the aggregate salaries ($28,450) for all common-law employees. She enters the amount of $4,267.50 contributed on behalf of her employees, on line 15a of Schedual C.

NOTE: In addition to covering her employees, Susan Brown purchased on her own behalf U.S. Government retirement bonds costing $7,500. This amount may not be deducted on Schedule C. It is claimed on line 25 of Form 1040 but is limited to the lesser of 15% of net profit shown on line 21 of Schedule C, or $7,500. Also, Susan Brown is required to file Form 5500-K.

(10) For 1979, Susan incurred interest of $633.19 on bank loans on her business indebtedness.

(11) Using the specific chargeoff method of accounting for bad debts in 1979 she wrote off $270 of worthless receivables.

(15) Charitable contributions are not deducted on Schedule C. During the year Milady Fashions made a gift of $50 to the United Fund. Susan may deduct this amount on Schedule A (Form 1040) if she itemizes deductions.

## SCHEDULE C INSTRUCTIONS

(16) The total of other business expenses not listed elsewhere on the Schedule C is $9,738.40. Each expense must be listed separately in the spaces provided.

Susan does not claim expenses for an office in her home and answers the question at the bottom of page 1 accordingly.

Expense accounts and entertainment expenses. Susan did not set up any expense accounts in her business. She therefore makes no entries in the spaces provided in Schedule C-3 for expense.

She then answers questions (1), (2), (3), and (4) in Schedule C-3. Because she had no expenses of this type, she marks NO for each.

If she had answered YES, she would have listed these expenses on line 19, Other business expenses, on page 1.

(17) Total deductions allowable on Schedule C amount to $55,747.49.

(18) Net profit of $51.203.65 is entered on line 13, Form 1040. She computes her self-employment tax on Schedule SE (Form 1040).

BUSINESS OPERATIONS

UNIT 1

**SCHEDULE C**
**(Form 1040)**
Department of the Treasury
Internal Revenue Service

# Profit or (Loss) From Business or Profession

(Sole Proprietorship)
Partnerships, Joint Ventures, etc., Must File Form 1065.
▶ Attach to Form 1040. ▶ See Instructions for Schedule C (Form 1040).

Name of proprietor | Social security number of proprietor

A Main business activity (see Instructions) ▶ ; product ▶
B Business name ▶
C Employer identification number ▶
D Business address (number and street) ▶
City, State and ZIP code ▶

**C**

E Accounting method: (1) ☐ Cash (2) ☐ Accrual (3) ☐ Other (specify) ▶
F Method(s) used to value closing inventory:
(1) ☐ Cost (2) ☐ Lower of cost or market (3) ☐ Other (if other, attach explanation)

| | Yes | No |
|---|---|---|
| G Was there any major change in determining quantities, costs, or valuations between opening and closing inventory? If "Yes," attach explanation. | ▨ | ▨ |
| H Does this business activity involve oil or gas, movies or video tapes, or leasing personal (section 1245) property to others? (See page 25 of the Instructions.) | | |
| I Did you deduct expenses for an office in your home? | | |

**Part I** Income

| | | | |
|---|---|---|---|
| 1 a Gross receipts or sales | 1a | | |
| b Returns and allowances | 1b | | |
| c Balance (subtract line 1b from line 1a) | | 1c | |
| 2 Cost of goods sold and/or operations (Schedule C–1, line 8) | | 2 | |
| 3 Gross profit (subtract line 2 from line 1c) | | 3 | |
| 4 Other income (attach schedule) | | 4 | |
| 5 Total income (add lines 3 and 4) ▶ | | 5 | |

**Part II** Deductions

| | | | |
|---|---|---|---|
| 6 Advertising | | 28 Telephone | |
| 7 Amortization | | 29 Travel and entertainment | |
| 8 Bad debts from sales or services | | 30 Utilities | |
| 9 Bank charges | | 31 a Wages | |
| 10 Car and truck expenses | | b New Jobs Credit | |
| 11 Commissions | | c Subtract line 31b from 31a | |
| 12 Depletion | | 32 Other expenses (specify): | |
| 13 Depreciation (explain in Schedule C–2) | | a | |
| | | b | |
| 14 Dues and publications | | c | |
| 15 Employee benefit programs | | d | |
| 16 Freight (not included on Schedule C–1) | | e | |
| | | f | |
| 17 Insurance | | g | |
| 18 Interest on business indebtedness | | h | |
| 19 Laundry and cleaning | | i | |
| 20 Legal and professional services | | j | |
| 21 Office supplies | | k | |
| 22 Pension and profit-sharing plans | | l | |
| 23 Postage | | m | |
| 24 Rent on business property | | n | |
| 25 Repairs | | o 80 | |
| 26 Supplies (not included on Schedule C–1) | | p | |
| | | q | |
| 27 Taxes | | r | |

| | | |
|---|---|---|
| 33 **Total deductions** (add amounts in columns for lines 6 through 32r) ▶ | 33 | |
| 34 **Net profit or (loss)** (subtract line 33 from line 5). Enter here and on Form 1040, line 13. **ALSO** enter on Schedule SE (Form 1040), line 5a. (For "at risk" provisions, see page 25 of Instructions.) ▶ | 34 | |

SCHEDULE C TAX FORM

## SCHEDULE C–1.—Cost of Goods Sold and/or Operations (See Schedule C Instructions for Part I, Line 2)

| | | | |
|---|---|---|---|
| 1 Inventory at beginning of year (if different from last year's closing inventory, attach explanation) | | 1 | |
| 2 a Purchases | 2a | | |
| b Cost of items withdrawn for personal use | 2b | | |
| c Balance (subtract line 2b from line 2a) | | 2c | |
| 3 Cost of labor (do not include salary paid to yourself) | | 3 | |
| 4 Materials and supplies | | 4 | |
| 5 Other costs (attach schedule) | | 5 | |
| 6 Add lines 1, 2c, and 3 through 5 | | 6 | |
| 7 Inventory at end of year | | 7 | |
| **8 Cost of goods sold and/or operations** (subtract line 7 from line 6). Enter here and on Part I, line 2 ▶ | | 8 | |

## SCHEDULE C–2.—Depreciation (See Schedule C Instructions for line 13)

**If you need more space, please use Form 4562.**

| Description of property (a) | Date acquired (b) | Cost or other basis (c) | Depreciation allowed or allowable in prior years (d) | Method of computing depreciation (e) | Life or rate (f) | Depreciation for this year (g) |
|---|---|---|---|---|---|---|
| 1 Total additional first-year depreciation (do not include in items below) → | | | | | | |
| 2 Other depreciation: | | | | | | |
| Buildings | | | | | | |
| Furniture and fixtures | | | | | | |
| Transportation equipment | | | | | | |
| Machinery and other equipment | | | | | | |
| Other (Specify) | | | | | | |
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| | | | | | | |
| 3 Totals | | | | | 3 | |
| 4 Depreciation claimed in Schedule C–1 | | | | | 4 | |
| **5 Balance** (subtract line 4 from line 3). Enter here and on Part II, line 13 ▶ | | | | | 5 | |

## SCHEDULE C–3.—Expense Account Information (See Schedule C Instructions for Schedule C–3)

**Enter information for yourself and your five highest paid employees. In determining the five highest paid employees, add expense account allowances to the salaries and wages. However, you don't have to provide the information for any employee for whom the combined amount is less than $25,000, or for yourself if your expense account allowance plus line 34, page 1, is less than $25,000.**

| Name (a) | Expense account (b) | Salaries and Wages (c) |
|---|---|---|
| Owner | | ▨ |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |

| Did you claim a deduction for expenses connected with: | Yes | No |
|---|---|---|
| A Entertainment facility (boat, resort, ranch, etc.)? | | |
| B Living accommodations (except employees on business)? | | |
| C Employees' families at conventions or meetings? | | |
| If "Yes," were any of these conventions or meetings outside the U.S. or its possessions? (See page 26 of Instructions.) | | |
| D Vacations for employees or their families not reported on Form W–2? | | |

# BUSINESS OPERATIONS

## UNIT 1

## ANSWERS TO SCHEDULE C PROBLEM

**SCHEDULE C**
**(Form 1040)**
Department of the Treasury
Internal Revenue Service

# Profit or (Loss) From Business or Profession

(Sole Proprietorship)
Partnerships, Joint Ventures, etc., Must File Form 1065.
► Attach to Form 1040. ► See Instructions for Schedule C (Form 1040).

Name of proprietor SUSAN J. BROWN

Social security number 481 44 6957

A Principal business activity (see Schedule C Instructions) ► RETAIL ; product ► LADIES' APPAREL

B Business name ► MILADY FASHIONS

C Employer identification number ► 11-4811838

D Business address (number and street) ► 725 BIG SUR DRIVE

City, State and ZIP code ► FRANKLIN, NEW YORK 18725

**C**

E Indicate method of accounting: (1) ☐ Cash (2) ☒ Accrual (3) ☐ Other ►

| | | Yes | No |
|---|---|---|---|
| F | Was an Employer's Quarterly Federal Tax Return, Form 941, filed for this business for any quarter in 1977? | ☒ | |
| G | Did you own the business at the end of 1977? | ☒ | |
| H | How many months in 1977 did you own this business? ► 12 | | |
| I | Check valuation method(s) used for total closing inventory: ☐ cost, ☒ lower of cost or market, ☐ other (if "other," attach explanation).<br>Was there any substantial change in determining quantities, costs, or valuations between opening and closing inventory? If "Yes," attach explanation. | | ☒ |

**Income**

| | | | | |
|---|---|---|---|---|
| [1] | 1 Gross receipts or sales $347,742.73 Less: returns and allowances $1,442.10 Balance ► | 1 | $ 346,300 | 63 |
| [2] | 2 Less: Cost of goods sold and/or operations (Schedule C-1, line 8) | 2 | 239,349 | 49 |
| [3] | 3 Gross profit | 3 | $ 106,951 | 14 |
| [4] | 4 Other income (attach schedule) | 4 | | |
| [5] | 5 Total income (add lines 3 and 4) | 5 | $ 106,951 | 14 |

**Deductions**

| | | | | |
|---|---|---|---|---|
| [12] | 6 Depreciation (explain in Schedule C-2) | 6 | $ 2,052 | 50 |
| [9] | 7 Taxes on business and business property | 7 | 2,802 | 75 |
| [7] | 8 Rent on business property | 8 | 4,800 | 00 |
| [8] | 9 Repairs | 9 | 1,774 | 15 |
| [6] | 10 Salaries and wages not included on line 3, Schedule C-1 (exclude any paid to yourself) | 10 | 28,450 | 00 |
| [16] | 11 Insurance | 11 | 950 | 00 |
| [16] | 12 Legal and professional fees | 12 | | |
| [16] | 13 Commissions | 13 | | |
| [13] | 14 Amortization (attach statement) | 14 | | |
| [14] | 15 a Pension and profit-sharing plans (see Schedule C Instructions) | 15a | 4,267 | 50 |
| | b Employee benefit programs (see Schedule C Instructions) | b | | |
| [10] | 16 Interest on business indebtedness | 16 | 633 | 19 |
| [11] | 17 Bad debts arising from sales or services | 17 | 279 | 00 |
| [13] | 18 Depletion | 18 | | |
| [16] | 19 Other business expenses (specify): | | | |

| | | | |
|---|---|---|---|
| a | SUPPLIES AND MATERIALS | $ 1,203 | 80 |
| b | ADVERTISING | 3,500 | 00 |
| c | HEAT AND LIGHT | 1,872 | 16 |
| d | CHAMBER OF COMMERCE | 25 | 00 |
| e | CREDIT REPORTS | 475 | 00 |
| f | TELEPHONE | 298 | 08 |
| g | POSTAGE | 516 | 12 |
| h | TRASH REMOVAL | 300 | 00 |
| i | WINDOW DRESSING | 298 | 10 |
| j | GASOLINE AND OIL | 1,250 | 14 |
| k | | | |
| l | | | |
| m | | | |
| n | | | |
| o | | | |

| | | | | |
|---|---|---|---|---|
| | p Total other business expenses (add lines 19a through 19o) | 19p | 9,738 | 40 |
| [17] | 20 Total deductions (add lines 6 through 19p) | 20 | $ 55,747 | 49 |
| [18] | 21 Net profit or (loss) (subtract line 20 from line 5). Enter here and on Form 1040, line 13. ALSO enter on Schedule SE, line 5a ► | 21 | $ 51,203 | 65 |

Did you claim a deduction for expenses of an office in your home? ☐ Yes ☒ No

235-060-1

# ANSWERS TO SCHEDULE C PROBLEM

Schedule C (Form 1040) Page 2

## SCHEDULE C-1.—Cost of Goods Sold and/or Operations
(See Schedule C Instructions for Line 2)

| | | | |
|---|---|---|---|
| 1 Inventory at beginning of year (if different from last year's closing inventory, attach explanation) | 1 | $ 32,843 | 66 |
| 2 Purchases $241,026.51. Less: cost of items withdrawn for personal use $ 774.42 Balance ► | 2 | 240,252 | 09 |
| 3 Cost of labor (do not include salary paid to yourself) | 3 | | |
| 4 Materials and supplies | 4 | | |
| 5 Other costs (attach schedule) | 5 | | |
| 6 Add lines 1 through 5 | 6 | $ 273,095 | 75 |
| 7 Inventory at end of year | 7 | 33,746 | 26 |
| 8 Cost of goods sold and/or operations (subtract line 7 from line 6). Enter here and on page 1, line 2 | 8 | $ 239,349 | 49 |

## SCHEDULE C-2.—Depreciation (See Schedule C Instructions for Line 6)
If you need more space, use Form 4562.

| a. Description of property | b. Date acquired | c. Cost or other basis | d. Depreciation allowed or allowable in prior years | e. Method of computing depreciation | f. Life or rate | g. Depreciation for this year | |
|---|---|---|---|---|---|---|---|
| 1 Total additional first-year depreciation (do not include in items below) → | | | | | | | |
| 2 Other depreciation: | | | | | | | |
| DELIVERY TRUCK #1 | 1-11-75 | $ 4,500.00 | $ 1,000.00 | STRAIGHT LINE | 4 YRS | $ 500 | 00 |
| DELIVERY TRUCK #2 | 1-5-76 | 5,000.00 | 875.00 | " " | 4 YRS | 875 | 00 |
| STORE COUNTERS AND FIXTURES | 1-3-73 | 5,250.00 | 2,100.00 | " " | 10 YRS | 525 | 00 |
| OFFICE EQUIPMENT | 1-12-73 | 1,525.00 | 610.00 | " " | 10 YRS | 152 | 50 |
| 3 Totals | | 16,275.00 | | | | $ 2,052 | 50 |
| 4 Depreciation claimed in Schedule C-1, above | | | | | | | |
| 5 Balance (subtract line 4 from line 3). Enter here and on page 1, line 6 | | | | | | $ 2,052 | 50 |

## SCHEDULE C-3.—Expense Account Information (See Schedule C Instructions for Schedule C-3)

Enter information with regard to yourself and your five highest paid employees. In determining the five highest paid employees, expense account allowances must be added to their salaries and wages. However, the information need not be submitted for any employee for whom the combined amount is less than $25,000, or for yourself if your expense account allowance plus line 21, page 1, is less than $25,000.

| Name | Expense account | Salaries and Wages | |
|---|---|---|---|
| Owner | | ▨ | ▨ |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

Did you claim a deduction for expenses connected with:

(1) Entertainment facility (boat, resort, ranch, etc.)? ☐ Yes ☒ No
(2) Living accommodations (except employees on business)? ☐ Yes ☒ No
(3) Employees' families at conventions or meetings? ☐ Yes ☒ No
(4) Employee or family vacations not reported on Form W-2? ☐ Yes ☒ No

# BUSINESS OPERATIONS

## UNIT 2

## APPLYING FOR STATE FARMER DEGREE

### TERMINAL OBJECTIVE

Upon completion of this unit, students will apply for the Kansas State Farmer Degree.

### SPECIFIC OBJECTIVES

Upon completion of this unit, students will be able to:

1. Correctly fill out the Kansas State Farmer Degree Application.
2. Evaluate themselves as State Farmer Candidates using the State Farmer Evaluation Sheet.

# BUSINESS OPERATIONS

## UNIT 2

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information Sheets
3. Discuss Terminal and Specific Objectives
4. Discuss Information Sheets
5. Assist students in filling out State Farmer Degree Application
6. Have students evaluate their own State Farmer Degree Application

Students:

1. Read Objectives
2. Study Information Sheets
3. Fill out State Farmer Application
4. Evaluate own State Farmer Application

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
   #1 - State Farmer Application
   #2 - State Farmer Application Evaluation
3. Evaluation of application

# BUSINESS OPERATION
## UNIT 2
## INFORMATION SHEET

For Discussion Purposes Only

APPLICATION FOR THE
STATE FARMER DEGREE
KANSAS ASSOCIATION OF FFA

Production ____
Agribusiness ____

____
Rank

Candidate ______________________________
Address ______________________________
FFA Chapter ______________________________

Applicant is a candidate for State Officer Yes ____ No ____

Unless all of the following 10 items are answered with a yes, the candidate is NOT qualified.

Advisor Evaluation

1. Received the Chapter Farmer Degree ____________
2. Been an active FFA member for at least 2 years (24 months) by date of receiving degree ____________
3. Completed at least 2 years of systematic instruction in Vocational Agriculture which includes at least 360 hours of instruction before submitting application ____________
4. Completed records submitted for each year from initial enrollment in vocational agriculture through December 31 preceding the date of receiving the degree ____________
5. Earned and productively invested at least $500 by his/her own efforts from his/her supervised farming and/or other agricultural occupational experience program

   or

   have worked (other than class scheduled time) at least 600 hours in directed laboratory experience program ____________

   or

   a combination of the two.
   (Indicate which qualification met)
6. Demonstrated leadership ability by:
   a. Performing ten parliamentary procedure activities ____________
   b. Giving a five-minute speech ____________
   c. Serving as an officer and/or committee chairman, or a participating member of a major committee ____________
7. Have a satisfactory scholastic record certified by the local superintendent or principal ____________
8. Participate in the planning and completion of chapter Program of Activities ____________
9. Participate in five FFA activities above the chapter level ____________
10. Have all signature blocks completed in the record book and application ____________

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# INFORMATION SHEET

## STATE FARMER APPLICATION

Part I (Production and Agribusiness Applicants)

Name______________________________________________Age_______Date__________________19____
(as you wish on the degree certificate)

High School__________________________________________Year in high school________________

A. SCHOLARSHIP ACHIEVEMENT (Production & Agribusiness)

Transcript of all high school subjects with grades to date:

Official school transcript may be attached

| Freshman Subjects | Unit | Grade | Sophomore Subjects | Unit | Grade |
|---|---|---|---|---|---|
| | | | | | |

| Junior Subjects | Unit | Grade | Senior Subjects | Unit | Grade |
|---|---|---|---|---|---|
| | | | | | |

B. Grade Point Average (on 4.0 system) ______________

Signed ______________________________
Superintendent or Principal

INFORMATION SHEET

C. Leadership activities from recordbook may be substituted for this page.

## LEADERSHIP ACTIVITIES

### Offices Held and Committee Responsibilities in the FFA

| School Year | Committee chairman, Office held | Unit: Local-State | Length of Service | School Year | Committee chairman, Office held | Unit: Local-State | Length of Service |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
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### Participation in FFA Activities for Awards and Recognition

List below activities such as: livestock judging, crop and soil judging, public speaking, FFA Foundation awards, FFA band, FFA chorus, individual showing of crops and livestock, recreational activities.

| School Year | Activity | Level of Participation | Placing or Winnings | Responsibility |
|---|---|---|---|---|
| | | | | |
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# INFORMATION SHEET

D. AGRICULTURAL MECHANICS CONSTRUCTION, REPAIR AND SERVICE JOBS (Production & Agribusiness)

| | Constructed, repaired, or serviced | | | Year in High School | | | |
|---|---|---|---|---|---|---|---|
| | Self | Father | Others | 1 | 2 | 3 | 4 |
| List of major construction and repair jobs completed in school shop: | | | | | | | |
| List of major construction repair and service jobs completed outside of the school shop: | | | | | | | |
| List the major machines serviced: | | | | | | | |

**INFORMATION SHEET**

E. Record of occupational skills. Pages may be substituted from recordbook.

## RECORD OF OCCUPATIONAL SKILLS

List the major jobs and a description of skills performed during occupation experience on job, school labs or supervised farming programs. Those who wish to keep a daily record of jobs performed may secure additional pages from their instructor. (Student may include initial, improvement and supplemental skills.)

This page should be checked by your instructor each grading period.

| Major Jobs or Skills | Date of Experience | Total Hours | Performed Satisfactorily Checked By Inst. |
|---|---|---|---|
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## INFORMATION SHEET

F. Net Worth Statement. May be substituted from recordbook.

# NET WORTH STATEMENT

| | ASSETS | Beginning of Year Values | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Year ____ | | Year ____ | | Year ____ | | Year ____ | |
| 1 | Crops, Grains and Feeds (Inv. Crops, Supplies, Land & Other L. 13) | | | | | | | | |
| 2 | Seeds (Inv. Crops, Supplies, Land & Other L. 18) | | | | | | | | |
| 3 | Supplies (Inv. Crops, Supplies, Land & Other L. 24) | | | | | | | | |
| 4 | Land (Inv. Crops, Supplies, Land & Other L. 28) | | | | | | | | |
| 5 | Other (Inv. Crops, Supplies, Land & Other L. 33) | | | | | | | | |
| 6 | Beef (Inv. Livestock L. 11) | | | | | | | | |
| 7 | Dairy (Inv. Livestock L. 18) | | | | | | | | |
| 8 | Swine (Inv. Livestock L. 27) | | | | | | | | |
| 9 | Sheep (Inv. Livestock L. 39) | | | | | | | | |
| 10 | Poultry (Inv. Livestock L. 43) | | | | | | | | |
| | Other (Inv. Livestock L. 46) | | | | | | | | |
| 12 | Other (Inv. Livestock L. 49) | | | | | | | | |
| 13 | Machinery and Equipment (from depreciation pages) * | | | | | | | | |
| 14 | Salvage Value on Above Items (from depreciation pages, L. 11, total col.) | | | | | | | | |
| 15 | Buildings and Improvements (from depreciation pages) * | | | | | | | | |
| 6 | Salvage Value on Above Items (from depreciation pages) | | | | | | | | |
| 17 | Receivable Cash (Inv. Receivables, L. 5, col. A) | | | | | | | | |
| 18 | Accounts (Inv. receivables, L. 12, col. A) | | | | | | | | |
| 19 | Total Assets (Total, Lines 1 thru 18) | | | | | | | | |
| | LIABILITIES | | | | | | | | |
| 20 | Payables (Inv. Payables, L. 22, col. A) | | | | | | | | |
| | | | | | | | | | |
| 21 | Business Net worth (L. 19 minus L. 20) | | | | | | | | |
| 22 | Personal Net Worth (from depreciation pages) | | | | | | | | |
| 23 | Total Net Worth (L. 21 + 22) | | | | | | | | |
| 24 | Change in Business Net Worth ** | | | | | | | | |
| 25 | Net income from sources other than your own business *** | | | | | | | | |
| 26 | Gain in business (net worth minus income from other sources) | | | | | | | | |
| 27 | Net Cash Business Income (from oper. stmt. method pg.____ col.____) (L. 26, col. B) | | | | | | | | |
| 28 | Profit or Loss from Operation (from operating statement, (L. 41 col. 5) | | | | | | | | |

*From depreciation pages for this type asset, total column depreciable balance of previous year

**Present year beginning net worth minus immediate past year's beginning inventory

***Income page column 1 minus expense page column 13

Part II. Agribusiness Applicants Only

## OCCUPATIONAL EXPERIENCE PROGRAM SUMMARY

A. Scope of applicant's supervised occupational experience program in agribusiness. (Only include activities and records completed up to January 1 of the year the application is submitted.)

| Record Year | Nature of Work Done (Job title or type of work) | Place of Training | Scope* | | Total Income (A) | Total Expenses (B) | Labor Income (C)** |
|---|---|---|---|---|---|---|---|
| | | | No. Mos. | No. Hrs. Wkd. | | | |
| First Year ____,19____ to Dec.31,19____ | | | | | | | |
| TOTAL $ | XXXXXXX | XXXX | | | | | |
| Second Year Jan.1,19____ to Dec.31,19____ | | | | | | | |
| TOTAL $ | XXXXXXX | XXXX | | | | | |
| Third Year Jan.1,19____ to Dec.31,19____ | | | | | | | |
| TOTAL $ | XXXXXXX | XXXX | | | | | |
| Fourth Year Jan.1,19____ to Dec.31,19____ | | | | | | | |
| TOTAL $ | XXXXXXX | XXXX | | | | | |
| | GRAND TOTAL $ | XXXX | | | | | |

* Total number of months applicant was placed and the number of hours experience received.

** Labor income = Total income - Total expenses.

## INFORMATION SHEET

B. Skills and Competencies:

List the five most significant skills or competencies which were achieved in your Agribusiness program. (Example: Communicating with Co-Workers and Management, Demonstrating Products in Selling, Receiving products into firm, Inventorying products in agribusiness, etc.)

1.

2.

3.

4.

5.

C. List the five most significant skills or compentencies you have developed as a result of training received in Vocational Agriculture (Example: Sharpening cutting edge tools, planning the wiring system, selecting concrete mixtures, adjusting machinery, etc.)

1.

2.

3.

4.

5.

D. Safety: List the five most significant safety precautions used in your agribusiness program.

1.

2.

3.

4.

5.

E. Describe the opportunity for advancement you have achieved in your agribusiness program and/or list the machinery owned relating to your supervised occupational experience program.

F. Describe the management responsibilities achieved in your agribusiness program.

G. Submit and attach a letter of recommendation by the employer or customer.

Part II. Production Applicants Only

A. Livestock and Crops Analysis

Candidates must list their total Entrepreneurship Type Programs, indicating the quantity or unit, total income, total expenses, labor income, percent owned and candidate's share of labor income. Enterprises and quantity or unit must be listed, but total returns, total expenses, net returns, candidate's share of labor income may be listed for all enterprises combined where records are kept on a farm or business account basis.

| YEAR | Enterprises Kind (See Note, Page D) | Scope | Total Income (A) | Total Expenses (B) | Labor Income (C) | % Candidate's Share | Candidate's Share of Labor Income |
|---|---|---|---|---|---|---|---|
| First Year ____,19___ to Dec.31,19___ | | | | | | | |
| TOTALS | XXXX | XXXX | $ | $ | $ | XXX | $ |
| Second Year Jan.1,19___ to Dec.31,19___ | | | | | | | |
| TOTALS | XXXX | XXXX | $ | $ | $ | XXX | $ |
| Third Year Jan.1,19___ to Dec.31,19___ | | | | | | | |
| TOTALS | XXXX | XXXX | $ | $ | $ | XXX | $ |
| Fourth Year Jan.1,19___ to Dec.31,19___ | | | | | | | |
| TOTALS | XXXX | XXXX | $ | $ | $ | XXX | $ |
| | Total in-School.................................. | | $ | $ | $ | XXX | $ |

Columns (A) - (B) = (C)

*This is to be a true, accurate, and complete summary, compiled from the details found in the supervised occupational records of the candidate. The National Advisor reserves the right to request any books from which these amounts were taken.

NOTE: An inventory increase must be shown as income. An inventory decrease must be shown as an expense.

## INFORMATION SHEET

B. Skills and Competencies: List the five most significant skills or competencies which were achieved in your production agricultural program (Examples: Selecting breeding livestock, match crops to their recommended planting depths, identify noxious weeds, balance livestock rations, etc.).

1.

2.

3.

4.

5.

C. List the five most significant marketing and finance management skills achieved in your production agricultural program (Examples: Increased profits by borrowing money for production expenses and project expansion, marketing products through contracts, cooperative purchases and sales, etc.).

1.

2.

3.

4.

5.

D. List the five most significant mechanic skills you have developed as a result of training received in Vocational Agriculture (Example: Sharpening cutting tools, planning the wiring system; selecting concrete mixtures, adjusting machinery, etc.).

1.

2.

3.

4.

5.

E. Safety: List the five most significant safety precautions taken in conducting your production agricultural program.

1.

2.

3.

4.

5.

F. List the five most significant efficiency factors that were achieved because of your supervised occupational experience program in Vocational Agriculture. (Examples: Percent calf crop, percent lamb crop, pounds of milk produced per cow, etc.)

1.

2.

3.

4.

5.

## INFORMATION SHEET

G. List the machinery and equipment owned relating to your production enterprises.

Description

1.

2.

3.

4.

5.

We have examined the credentials of ______________________ and find that the statements contained herein are correct.

______________________
Candidate

______________________
Superintendent or Principal of High School

______________________
Parent

______________________
Vocational Agriculture Instructor

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Agribusiness ___
Production ___

## STATE FARMER EVALUATION SHEET

100 Points Allowed

| | Maximum | Teacher Evaluation | District Evaluations |
|---|---|---|---|
| Part I. | | | |
| A. Scholarship - - (Grade point average based on a scale of A=4, B=3, C=2, D=1, F=0) | 10 | ________ | ________ |

| | |
|---|---|
| 3.75 - 4.0 | 10 |
| 3.50 - 3.74 | 9 |
| 3.25 - 3.49 | 8 |
| 3.00 - 3.24 | 7 |
| 2.75 - 2.99 | 6 |
| 2.50 - 2.74 | 5 |
| 2.25 - 2.49 | 4 |
| 2.00 - 2.24 | 3 |
| 1.75 - 1.99 | 2 |
| 1.50 - 1.74 | 1 |
| 1.49 & Above | 0 |

TOTAL SCORE ________

| | Maximum | Teacher Evaluation | District Evaluations |
|---|---|---|---|
| B. Leadership - - | 26 | | |
| 1.) Offices and Committee responsibilities | 4 | | |
| District Officer | 1 | ________ | ________ |
| Local Officer (1 pt. for each office, maximum of 2 pts.) | 2 | ________ | ________ |
| Committee Chairman | 1 | ________ | ________ |

TOTAL SCORE ________

| | Maximum | Teacher Evaluation | District Evaluations |
|---|---|---|---|
| 2.) Participation in FFA activities for Recognition and Awards | 10 | | |
| Public Speaking | | | |
| Local | 1 | ________ | ________ |
| District | 1 | ________ | ________ |
| Proficiency Award | | | |
| District Application | 1 | ________ | ________ |
| Leadership School | | | |
| Participation | 1 | ________ | ________ |
| District or State Judging Contests (1 point per area - Land, Crops, Meats, Entomology, Farm Management, Creed, Horticulture, Newswriting, Poultry, Livestock, Dairy, Dairy Products, Ag Mechanics) | 5 | ________ | ________ |
| Other (Chapter Awards, DeKalb Ag Award, Golden Harvest, Hoards Dairymen, etc.) | 1 | ________ | ________ |

TOTAL SCORE ________

| | Maximum | Teacher Evaluation | District Evaluation |
|---|---|---|---|
| 3.) Leadership Activities Sponsored by the FFA | 6 | | |
| a. Radio, TV, or other speaking on behalf of FFA | 1 | ____ | ____ |
| b. State FFA Leadership Camp | 1 | ____ | ____ |
| c. State FFA Convention | 1 | ____ | ____ |
| d. National FFA Convention | 1 | ____ | ____ |
| e. Greenhand Conference | 1 | ____ | ____ |
| f. Other (National Leadership Conference, District Leadership Conference, WEA, etc.) | 1 | ____ | ____ |

TOTAL SCORE ____

| | Maximum | Teacher Evaluation | District Evaluation |
|---|---|---|---|
| 4.) Activities Sponsored by FFA (BOAC, Safety, Fruit Sales, etc. - 1 pt. per activity) | 3 | | |
| ____ | 1 | ____ | ____ |
| ____ | 1 | ____ | ____ |
| ____ | 1 | ____ | ____ |

TOTAL SCORE ____

| | Maximum | Teacher Evaluation | District Evaluation |
|---|---|---|---|
| 5.) Leadership in School and Community (1 pt. per activity class officers, athletics, church, 4-H, Scouts, etc.) | 3 | | |
| ____ | 1 | ____ | ____ |
| ____ | 1 | ____ | ____ |
| ____ | 1 | ____ | ____ |

TOTAL SCORE ____

| | Maximum | Teacher Evaluation | District Evaluation |
|---|---|---|---|
| C. Agricultural Mechanics - - (Based on quantity, quality, variety, and complexity in at least 3 of the following 5 areas in order to receive maximum points: Structures & Environment; Electric Power; Power and Machinery; Soil & Water Management; and Ag Mechanic Skills. These may include projects, skills & servicing.) | 8 | ____ | ____ |

TOTAL SCORE ____

100

## STATE FARMER EVALUATION SHEET

| | **Maximum** | **Teacher Evaluation** | **District Evaluations** |
|---|---|---|---|
| Part II (Agribusiness Only) | | | |
| A. Occupational Experience Program | 36 | | |
| 1. Gain in Business Net Worth | (6) | | |
| a. One point for each $500.00 gain in Business Net Worth with a maximum of 3 points. | 3 | | |
| b. Add 1 point each time the beginning Business Net Worth is doubled with a maximum of 3 points. | 3 | | |
| 2. Scope of Candidates Supervised Occupational Experience Program (Occup. Exp. Program Summary page) | 10 | | |
| 3. Skills and Competencies achieved | 4 | | |
| 4. Five most significant mechanic skills | 4 | | |
| 5. Five most significant safety factors | 4 | | |
| 6. Position advancement or machinery, equipment, & facilities owned relating to candidates occupational experience program | 3 | | |
| 7. Management responsibilities | 3 | | |
| 8. Letter of recommendation by employer or customer | 2 | | |
| B. Record Book | 20 | | |
| 1. Completeness | 14 | | |
| a. Supervised occupational experience program | | | |
| 1) Program Pictures & clippings | 1 | | |
| 2) Record of Occupational skills | 3 | | |
| 3) Memo of training plan | 1 | | |
| 4) Description of cooperating business | 1 | | |
| b. Income | 1 | | |
| c. Business Expenses (includes payroll deductions) | 2 | | |

TOTAL SCORE ____________

| | Maximum | Teacher Evaluation | District Evaluation | |
|---|---|---|---|---|
| d. Personal expenses | 1 | | | |
| e. Cash Flow | 1 | | | |
| f. Inventory | 1 | | | |
| g. Depreciation | 1 | | | |
| h. Net Worth Statement | 1 | | | |
| | | | | TOTAL SCORE ________ |
| 2. Accuracy | 6 | | | |
| a. Cash Balance (Sheet must be enclosed with application) Within 1% of cash income -- 3 pts, 1 - 5% -- 2 pts, 5 - 10% -- 1 pt, over 10% -- 0 pt. | 3 | | | |
| b. Accurate throughout | 3 | | | |
| | | | | TOTAL SCORE ________ |
| Part II (Production Agriculture Only) | | | | |
| A. Farming Program | 30 | | | |
| 1. Gain in Net Worth | 8 | | | |
| a. One point for each $500.00 gain in net worth with a maximum of 4 points. | 4 | | | |
| b. Add two points each time the beginning net worth doubled with a maximum of 4 points. | 4 | | | |
| | | | | TOTAL SCORE ________ |
| 2. Growth, Size, and Scope of Production Enterprises (This may include one or more) | 10 | | | |
| | | | | TOTAL SCORE ________ |
| 3. Skills and competencies achieved | | | | |
| a. Production Management | 2 | | | |
| b. Marketing and Finance Management | 2 | | | |
| c. Mechanic skills related to farming program | 2 | | | |
| d. Safety factors related to farming program | 2 | | | |
| | | | | TOTAL SCORE ________ |

| | Maximum | Teacher Evaluation | District Evaluations | |
|---|---|---|---|---|
| 4. Efficiency factors relative to farming program | 2 | | | |
| | | | | TOTAL SCORE |
| 5. Machine and/or equipment owned relating to candidates production enterprises | 2 | | | |
| | | | | TOTAL SCORE |
| B. Record Book | 26 | | | |
| 1. Completeness | 20 | | | |
| a. Supervised occupational experience program | | | | |
| 1) Pictures & clippings | 1 | | | |
| 2) Plans for long time farming program | 1 | | | |
| 3) Farming program agreement | 1 | | | |
| 4) Record of occupational skills | 1 | | | |
| b. Income | 1 | | | |
| c. Business expenses | 1 | | | |
| d. Personal expenses | 1 | | | |
| e. Cash Flow | 1 | | | |
| f. Inventory | 1 | | | |
| g. Depreciation schedule | 2 | | | |
| h. Operating statement | 1 | | | |
| i. Livestock &/or crop enterprise records including program analysis | 8 | | | |
| | | | | TOTAL SCORE |
| 2. Accuracy | 6 | | | |
| a. Cash Balance (Sheet must be enclosed with application) Within 1% of cash income - 3 pts., 1 - 5% -- 2 pts., 5 - 10% -- 1 pt., over 10% -- 0 pt. | 3 | | | |
| b. Accuracy Throughout | 3 | | | |
| | | | | TOTAL SCORE |

## BUSINESS OPERATIONS

## UNIT 2

## EVALUATION

1. Fill out Kansas State Farmer Degree Application
2. Evaluate your Kansas State Farmer Degree Application using the State Farmer Evaluation Sheet.

# GREENHOUSE

## UNIT 1

## MANAGING THE GREENHOUSE ENVIRONMENT

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to list the factors involved in environmental control in greenhouse operations. This objective will be considered achieved upon attainment of a score of at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Match terms concerning managing the greenhouse environment with their definitions.
2. List five environmental factors that can be controlled in a greenhouse.
3. Select from given statements those that are true concerning reasons for controlling light in greenhouse production.
4. Select correct statements concerning reasons for controlling temperature in the greenhouse.
5. Select correct statements concerning reasons for controlling moisture in the greenhouse.
6. List six reasons for ventilating a greenhouse.
7. List four effects of relative humidity on plant growth.
8. Control temperature with ventilation. (Job Sheet #1)

## GREENHOUSE

## UNIT 1

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information Sheets
3. Provide students with Job Sheet
4. Discuss Information Sheets
5. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Complete Job Sheet
4. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Job Sheet

   #1 - Controlling Greenhouse Temperature with Ventilation
4. Test
5. Answers to Test

References:

1. Laurie, Alex., Kiplinger, D. C., and Nelson, Kennard, Commercial Flower Forcing. McGraw-Hill Book Co., New York, New York. 1968.
2. Nelson, Kennard S., Flower and Plant Production in the Greenhouse, The Interstate Printers & Publishers, Inc., Danville, Ill. 1966.
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# GREENHOUSE

## UNIT 1

## INFORMATION SHEET

I. Terms and definitions:

- A. Duration - Length of time plants are exposed to light.
- B. Foot-candle - The density of light from one candle one foot away.
- C. Hard water - Water which has 200-300ppm of dissolved calcium and/or magnesium carbonate in it.
- D. Intensity - Amount of light striking a surface.
- E. Light quality - The wave length composition of light.
- F. Lite - Pane of glass or other material used to glaze a greenhouse.
- G. Photoperiod - The effect of the length of light or the dark period on the development of plants.
- H. ppm - Parts per million.
- I. Relative humidity - The percentage of water vapor in the atmosphere at a given temperature compared to the amount that could be held if the air were saturated.
- J. Salts - The amount of dissolved mineral elements (not only sodium chloride).
- K. Ventilation - The exchange of air.

II. Environmental factors than can be controlled in a greenhouse.

- A. Light
- B. Temperature
- C. Moisture
- D. Relative humidity
- E. Ventilation

III. Reasons for controlling light:

- A. Light is one of the most important factors influencing plant growth.
- B. Light varies in intensity, duration, and quality which causes different plant reactions.
- C. Natural light intensity may vary greatly from 12,000 ft.-candle during summer to 300 ft.-candles on a cloudy winter day.
- D. Reducing light intensity in the greenhouse is accomplished by using roof shading compound or shading cloth.

## INFORMATION SHEET

E. Where added illumination is needed artificial light sources may be used.

F. Plants mainly utilize the radiation from both ends of the light spectrum - blues and the reds of the light.

G. Increasing light intensity generally results in greater photosynthesis if plants have been in shaded areas.

H. Excessive light intensity may destroy the chlorophyll.

I. Uneven distribution of light to a plant cause stems to bend toward lgiht source.

J. Bright light may fade flower colors.

K. The optimum day length varies with each plant species.

L. Certain plants can be made to flower out of season by controlling day length.

M. To provide for short day (or long night) plants are covered at the appropriate time some material inpervious to light.

N. To provide long days artificial lighting is used.

IV. Reasons for controlling temperature

A. Many plants can be forced to flower by regulating temperatures.

B. Temperature affects quantity and quality of plants or flowers.

C. Generally plants require lower night temperatures than day temperatures.

D. Generally the rate of chemical reaction will double with every 10°C increase in temperature.

E. Rate of photosynthesis depends on temperature up to optimum rates then rate decreases.

F. Higher temperatures generally cause faster respiration rates.

G. As temperature increases transpiration increases.

H. Soil temperature will affect rate of absorption.

I. As soil temperature increases rate of absorption increases.

J. High temperatures can cause "scalding" or dying of plant tissue.

K. Freezing can cause injury or death but many plants will not freeze until 29°-30°F because of dissolved materials.

L. If tissues are frozen, thaw slowly to reduce damage.

M. When propagating plants maintain soil temperature 5°-10°F higher than air temperature.

N. Some plant parts will not develop unless exposed to cool temperatures for several weeks (example - bulbs).

## INFORMATION SHEET

O. The formation or initiation of flower buds may be dependent on temperature.

P. Flower bud development is also dependent upon temperature.

Q. Automatic heat control is required for uniform high quality flower production.

R. Cooling system for summer production is a must and should also be automatically controlled.

V. Reasons for controlling moisture.

A. Plants grow luxuriantly and flower profusely only with an adequate supply of water.

B. Minerals are in solution in water when taken into plant.

C. Proper regulation of moisture supply allows growth regulation in plants.

D. Moisture is critical in rooting cuttings.

E. Germinating seeds require uniform moisture.

F. No satisfactory rate can be given concerning watering because of differences in texture, structure, and organic matter in soil.

G. Generally, if surface of soil is dry - water the plant.

H. Water to moisten total profile, light sprinklings are harmful - lower profile dries out.

I. If water is applied by hose on the surface use water breakers.

J. Manual or automatic irrigation systems may be used to water one or several benches at a time.

VI. Effects of relative humidity on plant growth.

A. Transpiration is greater at lower relative humidities.

B. At high relative humidities photosynthesis is greater.

C. High relative humidity may encourage certain disease organisms to develop.

D. Increase in temperature without increase in moisture lowers the relative humidity.

E. Circulation of air reduces pockets of high relative humidity around plants.

F. Spraying walks and foliage will raise relative humidity temporarily.

G. Misting systems on propagation benches can result in faster rooting.

## INFORMATION SHEET

VII. Reasons for ventilation of growing structures.

A. $CO_2$ concentration is often the limiting factor in photosynthesis.

B. Higher temperature and higher light intensities require adequate ventilation to provide $CO_2$.

C. $CO_2$ may be supplied by

1. Compressed gas release in greenhouse.
2. Burning various fuels in specially designed equipment.

D. $CO_2$ is generally used from November through March where outside ventilation is limited.

E. $CO_2$ is an aid to grower not a cure all.

F. Temperature can be regulated by induction of fresh air.

G. Relative humidity can be regulated by ventilation.

H. Some disease organisms can be controlled by adequate ventilation.

# GREENHOUSE

## UNIT 1

## JOB SHEET #1: Controlling Greenhouse Temperature with Ventilation

Purpose: To demonstrate the effect of ventilation through a fan and pad system on air temperature.

I. Materials needed:

1. Access to greenhouse with fan and pad system.
2. A box 2' x 2' x 4' open on ends with 2 layers of cheese cloth tacked over one end and moistened.
3. Household thermometer.

II. Procedure:

If using a greenhouse do not jeopardize the crops being grown.

1. Turn off fan and pad system for 15 minutes (demonstration works best with 80°F outside air temperature).
2. Record greenhouse air temperature of several locations.

   Temperature A______ B______ C______ D______ E______
3. Turn on fan and pad system for 15 minutes.
4. Record greenhouse air temperature again of the previous locations.

   Temperature A______ B______ C______ D______ E______

III. What did you learn?

# GREENHOUSE
## UNIT 1
## TEST

1. Match the following terms with their definitions.

_____A. Photoperiod
_____B. Duration
_____C. Ventilation
_____D. Salts
_____E. Foot-candle
_____F. ppm
_____G. Hard water
_____H. Intensity
_____I. Relative Humidity
_____J. Light Quality
_____K. Lite

1. The exchange of air.
2. The wave length composition of light.
3. Parts per million.
4. The percentage of water vapor in the atmosphere at a given temperature compared to the amount that could be held if the air were saturated.
5. Amount of light striking a surface.
6. The effect of the length of the dark period on the development of plants.
7. The amount of dissolved mineral elements (not only sodium chloride).
8. The density of light from one candle one foot away.
9. Water which has 200-300 ppm of dissolved calcium and/or magnesium carbonate in it.
10. Length of time plants are exposed to light.
11. Pane of glass or other material used to glaze a greenhouse.

2. List five environment factors that can be controlled in a greenhouse.

3. Select the correct statements concerning reasons for controlling light in greenhouse production. Make an "X" in front of the correct statements.

_____A. Light is one of the most important factors influencing plant growth.
_____B. Plants mainly need the light from the middle of the light spectrum.
_____C. Bright light may fade flower colors.
_____D. Artificial lights can not be substituted for natural light for long days.
_____E. To provide long nights (or short days) plants can be covered with material impervious to light.
_____F. Variations in light intensity, duration and quality can cause different plant reactions.
_____G. Excessive light intensity can not destroy chlorophyll.
_____H. Natural light intensity may vary from 300 ft. candles to 12,000 ft. candles.
_____I. Uneven distribution of light is of no concern in greenhouse

## TEST

operations.

_____J. Reduction of light intensity is accomplished by replacing the lites with opaque material.

_____K. Species of plants have varying day length requirements.

_____L. Plants can be made to flower out of season by controlling day length.

_____M. Photosynthesis can not be affected by change in light intensity.

_____N. Incandescent and flourescent light can be used to provide added illumination.

4. Select by marking with an "X" the correct reasons for controlling temperature in a greenhouse.

_____A. Temperature affects quality and quantity of plants or flowers

_____B. High temperatures can cause drying of plant tissue.

_____C. Optimum photosynthesis rate depends on temperature.

_____D. As temperature increases transpiration decreases.

_____E. As temperature decreases respiration increases.

_____F. As soil temperature increases rate of absorption increases.

_____G. Freezing can cause injury or death of plants.

_____H. Freezing may not occur until temperature reaches 29°-30°F because of dissolved materials.

_____I. If freezing occurs, thaw slowly to reduce injury.

_____J. When propagating plants maintain soil temperature 5°-10°F below air temperature.

_____K. Some plants will not develop unless exposed to cold temperatures.

_____L. Generally the rate of chemical reaction will double with every 10°C increase in temperature.

_____M. Plants generally require higher night temperatures than day temperatures.

5. Select by marking with an "X" the correct reasons for controlling moisture in the greenhouse.

_____A. If water is supplied to a growing surface with a pressure hose a water breaker must be used.

_____B. Generally if the soil surface is dry the plants should be watered.

_____C. Moisture is critical in the rooting of cuttings.

_____D. Germination has no definite need for continuous moisture.

_____E. Plant growth can be controlled by regulating water supply.

_____F. Minerals are taken into the plants' roots in solid form.

_____G. Plants will grow luxu[illegible]ly and flower profusely only with adequate supply of [illegible]

# TEST

6. List four effects of relative humidity on plant growth.

7. List six reasons for ventilating a greenhouse.

8. Complete Job Sheet 1 to the satisfaction of the instructor.

# GREENSHOUSE

## UNIT 1

## ANSWERS TO TEST

1. A. 6
   B. 10
   C. 1
   D. 7
   E. 8
   F. 3
   G. 9
   H. 5
   I. 4
   J. 2

2. Light
   Temperature
   Moisture
   Relative Humidity
   Ventilation

3. "X" the following - A,C,E,F,H,R,L,N

4. "X" the following - A,B,C,F,G,H,I.K,L

5. "X" the following - A,B,C,E,G

6. (Any four in any order)

   Transpiration is greater at lower relative humidities.

   Photosynthesis is greater at higher relative humidities.

   High relative humidity may encourage certain disease organisms to develop

   Increase in temperature without additional moisture decreases relative humidity

   Ventilation can cause lower relative humidity

   Syringing can raise relative humidity

   Misting systems on propagation benches can increase rooting speed.

7. (Any six in any order)

   $CO_2$ concentration is often the limiting factor in photosynthesis

   Higher temperature and higher light intensities require higher amounts of $CO_2$

   $CO_2$ can be supplied by compressed containers or burning of fuels

   $CO_2$ is generally used from November to March where ventilation is limited.

   $CO_2$ is an aid to growers, not a cure all.

   Temperature can be regulated by induction of fresh air.

## ANSWERS TO TEST

Relative humidity can be regulated by ventilation

Some diseases can be controlled by adequate ventilation.

8. Complete Job Sheet 1 to the satisfaction of the instructor.

# RETAIL FLOWERSHOP OPERATION
# UNIT 1
# FLORAL DESIGN

## TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to define floral design terms; be able to construct different flower arrangements, and types of corsages and decorative accessories related to floral design. This objective will be considered achieved upon attainment of a score of at least eighty-five percent on the test.

## SPECIFIC OBJECTIVES

Upon completion of this unit, students will be able to:

1. Define terms that relate to floral design.
2. List four basic techniques in construction of an arrangement.
3. List two common types of corsages.
4. List four principles of design for a corsage.
5. List three methods of wiring flowers for corsage work.
6. List the four basic techniques of construction for a corsage.
7. Describe how to face a flowering pot plant.
8. Describe how to make a horizontal design arrangement.
9. List four items that help determine the price of an arrangement.
10. Describe how to determine materials needed for, and to construct an arrangement.
11. Describe how to construct a shoulder corsage.
12. Describe how to make a bow.
13. Describe how to make a boutonniere.
14. Describe how to decorate a flowering pot plant.

## RETAIL FLOWERSHOP OPERATION

## UNIT 1

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information and Assignment Sheets
3. Make Transparencies
4. Discuss Terminal and Specific Objectives
5. Discuss Information Sheets
6. Demonstrate and discuss procedures outlined in the Job Sheets
7. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Complete Assignment Sheet and turn it in to instructor
4. Demonstrate the abilities to accomplish the procedures outlined on the Job Sheets
5. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheet
3. Transparency Masters
    - #1 - Methods of Wiring
    - #2 - Bow Making
4. Example Sheets
    - #1 - Retail Cost on Miscellaneous Items
    - #2 - Prices
5. Assignment Sheet
    - #1 - Wiring Techniques

6. Job Sheets
   - #1 - Make a Horizontal Design Arrangement
   - #2 - Determine Materials Needed and Construct an Arrangement
   - #3 - Shoulder Corsage Construction
   - #4 - Bow Making
   - #5 - Boutonnieres
   - #6 - Decorating a Flowering Pot Plant
   - #7 - Pricing an Arrangement
7. Test
8. Answers to Test and answers to Job Sheet #7

References:

1. Benz, M. Buddy, *Flowers: Geometric Form*, San Jacinto Publishing Co., P. O. Box 66254, Houston, Texas 77006.
2. Pfahl, Peter, *The Retail Florist Business*, The Interstate Printers and Publishers, Inc., Danville, Illinois, 1973.
3. *Retail Flowershop Operation and Management*, The Pennsylvania State University, College of Agriculture, Agricultural Experiment Station, Department of Agricultural Education, University Park, Penn., 1968.
4. Tucker, Jeanne, *Flowers to Wear, Parts One, Two, and Three*, Vocational Education Productions, California State Polytechnic College, San Luis Obispo, California 93401.
5. *Florists Review*, Published weekly by Florists Publishing Co., 310 South Michigan Avenue, Chicago, Ill. 60604.
6. *Florists* Published monthly by Florists Transworld Delivery Association, 29200 North Western Highway, P.O. Box 2227, Southfield, Michigan 48037.
7. *Care and Handling of Flowers and Plants* Published by Society of American Florists, Washington, D.C.

# RETAIL FLOWERSHOP OPERATION

## UNIT 1

## INFORMATION SHEET

I. Terms and Definitions

- A. Boutonniere - flower worn by a man - no ribbon should be used with it.
- B. Facing or "Face" of plant - Refers to the plant's most attractive side.
- C. Perpendicular - Upright or vertical
- D. Horizontal - Parallel to the ground
- E. Scale - Relationship in size of one part of a corsage to other parts.

II. Flower Arranging: Refer to "Flower Arranging" Unit Hort I for additional information.

- A. Basic techniques of construction of a horizontal arrangement.
  - 1. Prepare the container
    - A. Select container
    - B. Insert holding device
    - C. Secure holding device
  - 2. Establish lines
    - A. Place a stem of flowers in center of holding device - make sure it is perpendicular.
    - B. Place stems of flowers of the same length horizontally on opposite ends of container.
  - 3. Establish the focal points
    - A. Use approximately three flowers to form a focal point on each side of arrangement.
    - B. Place these flowers at the base of the perpendicular flower.
  - 4. Filling in
    - A. Fill in, keeping materials in bounds set up in Set 2
    - B. Use flowers, foliage and other materials to fill in .
- B. Techniques of construction will differ with each geometric design you wish to construct. Consult references for different types of arrangements .

## INFORMATION SHEET

III. Pricing out an arrangement

A. The price of an arrangement will depend upon items included in the arrangement. Some of these items are:

1. Flowers
2. Container & holding device
3. Labor
4. Deliver (if arrangement is to be delivered)
5. Accessories used
6. Sales tax
7. Phone cost if applicable.
8. See example for additional items .

B. Each shop may have a different method of pricing or may figure pricing on the above items differently or may include more items See Example #2.

IV. Corsage and Boutonniere Construction

A. Types of Corsages

1. Shoulder corsages are most popular, wear with flowers facing upward.
2. Waist Corsages
3. Wrist Corsages
4. Corsages worn in the hair

B. Principles of design

1. Security: Flowers and accent material used in a corsage must be secure.
2 . Scale: The units of the corsage must not only be in scale to each other, but also to the person wearing the corsage.
3. Compactness: Each flower should stand out as an individual, yet blend with foliage and ribbon into a harmonious design .
4. Focal Point: Is that point at which the stems of the flowers meet.
5. Balance: Smaller flowers are placed on the edges, and the larger ones in the center of the design .
6. Weight: It is imperative that corsages be as light and airy as possible.

## INFORMATION SHEET

C. Methods of Wiring

1. Piercing
2. Clutchwire
3. Hookwire
4. Hair pin

D. Techniques of Construction

1. Wire and tape each flower to be used.
2. Add backing to each flower.
3. Assemble: each flower must be tied, wired or attached to the others individually. Start with smallest flower and work down.
4. Finish:
    a. Place largest flower at the base.
    b. Add bow and pin.

E. Bowmaking: This is only one of many methods - see references for additional methods or visit a florist shop for possible assistance.

1. Hang ribbon over your left thumb with the long side in front. The ribbon should be about two inches behind the thumb as shown in Step 1.
2. With your right hand take the long side of the ribbon and loop it under and around the left thumb. Squeeze the ribbon between the left thumb and forefinger as in Step 2.
3. Grasp the ribbon with the right hand about three inches from the crushed part and make a loop in the air. Bring the ribbon to the spot between the left thumb and forefinger and crush it between the two as in Step 3. The ribbon must always be looped "under" so the ribbon will fit between the left thumb and forefinger. Never leave the ribbon flat, but crush it after each loop. Looping over instead of under will make bow tying more difficult.
4. Go down the ribbon three inches and loop it up under. Crush again between the left thumb and forefinger. Now we have our first two loops as shown in Step 4.
5. Three or four more loops are made in each direction until the bow reaches the proper size. Each set of loops should be slightly larger than the previous set. This will give the bow more character. See Step 5.

## INFORMATION SHEET

6. Cut another piece of ribbon about eight inches long. Insert this under the first small loop in place of your left thumb. Do this by pulling it down on both sides. You can tie it at the back. This will hold the bow as you have constructed it.
7. Using the two ends of the short piece which you used to tie the bow together, fasten the bow to the corsage snugly against the bottom flower and tie securely with the short ribbon ends.
8. Trim off any ribbon ends that seem too long, and your corsage is finished.

F. Boutonnieres: For all flowers, they are wired and taped, leaving only a short stem. Under no conditions should ribbon be used.

V. Decorating a Flowering Pot Plant.

A. The foil color and ribbon color should match either the flower or foliage color. Exceptions to this are sometimes pleasing. Refer to color harmonies in reference.

B. Foil is cut from roll to form a square piece.

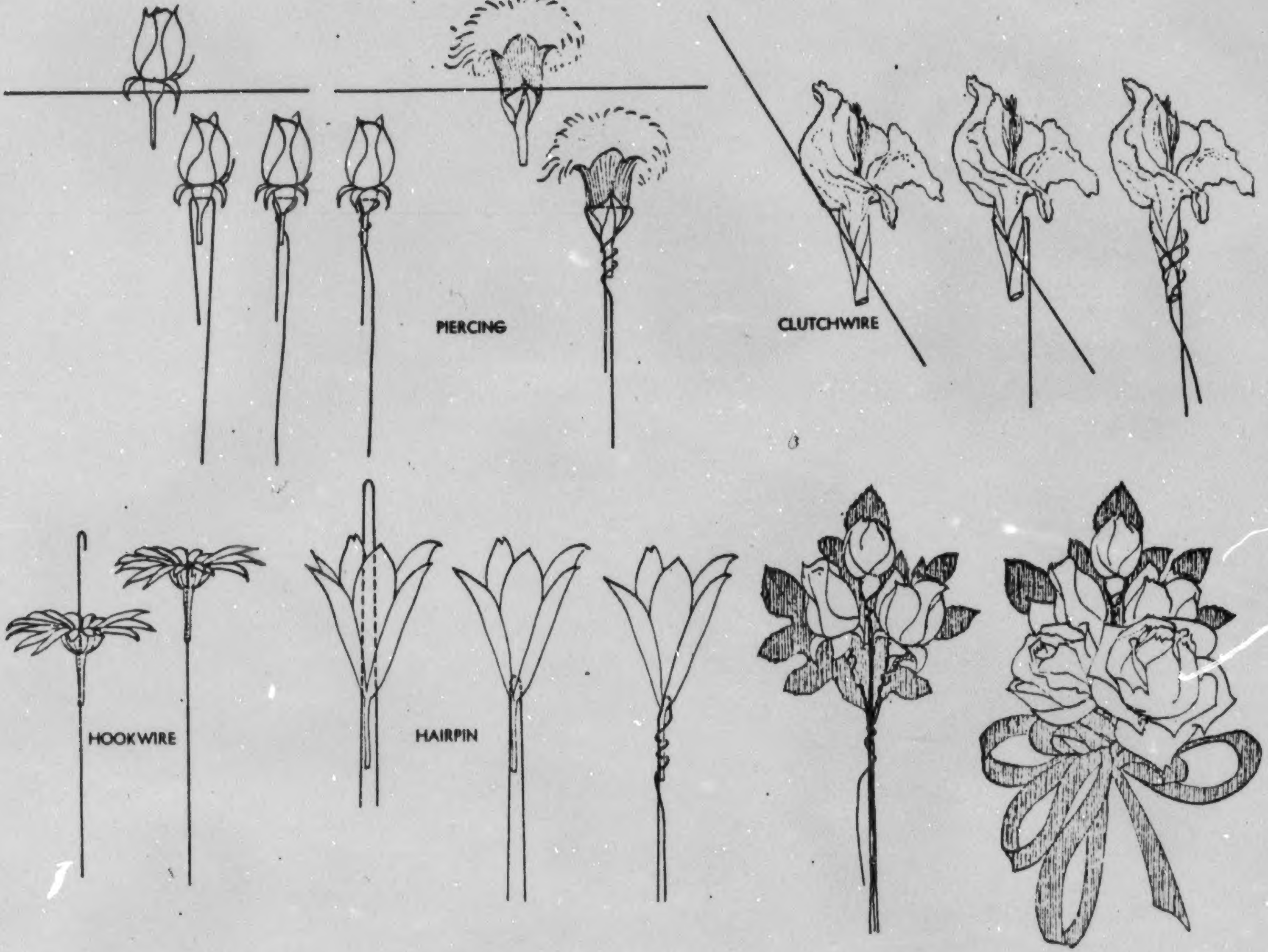
C. Pot is placed in center of foil.

D. Foil is crimped around the pot tim to hold it in place.

E. Bow is tied from ribbon that is 1½ to 2 inches wide.

F. Bow is wired to a wodden pick and inserted through foil into soil at pot edge.

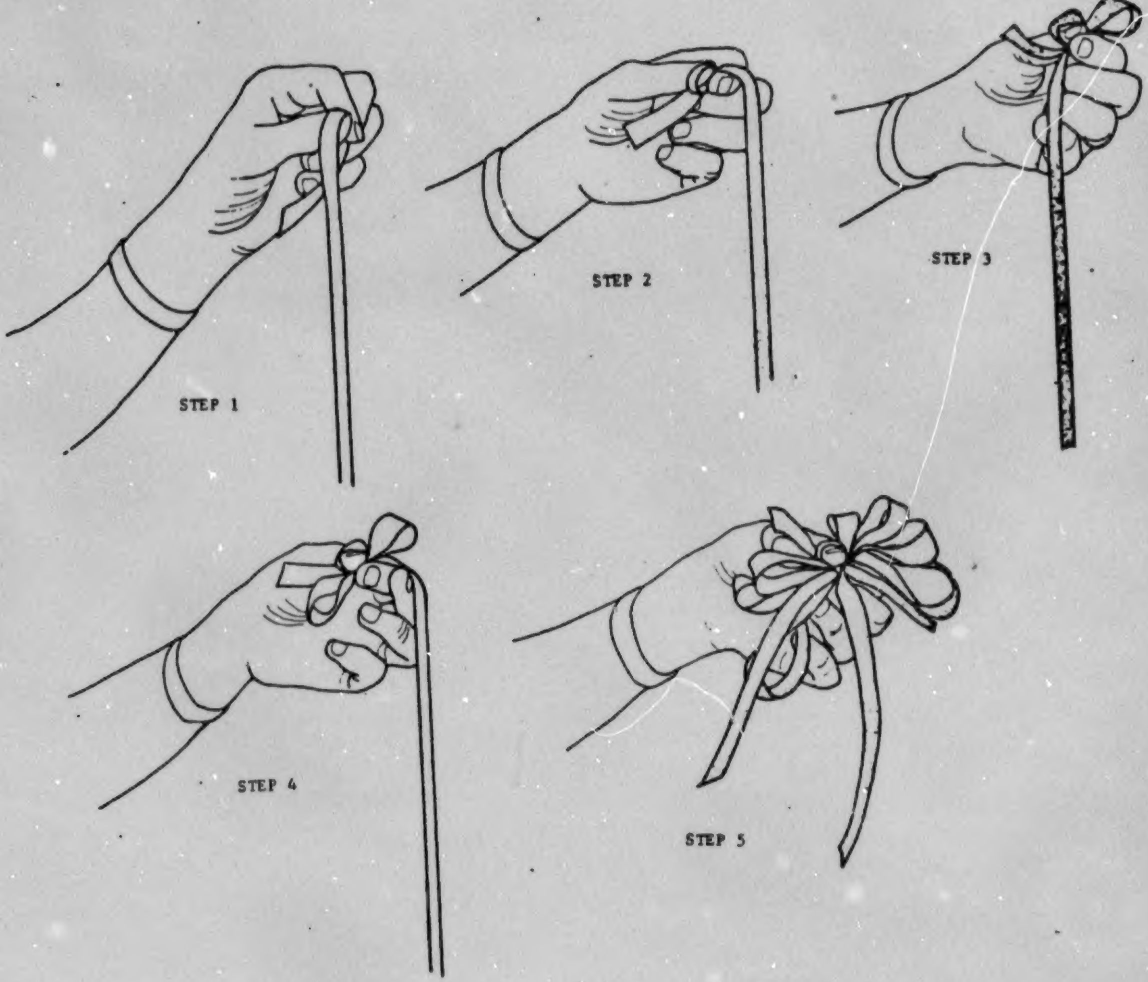
G. Place bow at the most attractive side of the plant or the "face" of the plant.


PIERCING
CLUTCHWIRE
HOOKWIRE
HAIRPIN

TM 1

HORTIII SD U1-8

Methods of wiring flowers. (Courtesy of The Pennsylvania State University Agricultural Education Department)


STEP 1
STEP 2
STEP 3
STEP 4
STEP 5

Steps in tying a bow. (Courtesy of The Pennsylvania State University Agricultural Education Department)

# RETAIL FLOWERSHOP OPERATION

## UNIT 1

## EXAMPLE 1

### Retail Cost on Misc. Items

| | |
|---|---|
| Corsage pins | 2¢ ea. |
| Bout. pins | 2¢ ea. |
| Canes stakes | 10¢ ea. |
| Wire | 2¢ ea. |
| Wood picks | 2¢ ea. |
| Ribbon - Satin #3 - 5¢ a yd. | Velvet - #3 - 15¢ a yd. |
| Satin #9 - 9¢ a yd. | Velvet - #9 - 25¢ a yd. |
| Satin #40 - 15¢ a yd. | Velvet - #40 - 50¢ a yd. |
| Satin #100 - 20¢ a yd. | |
| Foam | 95¢ a block |
| Moss | 4.00 a lb. |
| Floralife | 10¢ per package |
| Elastic gold bands | 5¢ ea. |
| Floral tape | 50¢ a roll |
| Pettypoint | 1.00 sheet |
| Foil | 25¢ yd. |
| Corsage bags | 5¢ ea. |
| Paradise candle refills | 15¢ ea. |

# RETAIL FLOWERSHOP OPERATION

## UNIT 1

## EXAMPLE 2

### Prices

| | | |
|---|---|---|
| Potted plants: | Top price | Full dressed, delivered, cash/change |
| | Middle price | Full dressed, (Hat & bow), C&C. |
| | Low price | Base price, bare pot as in C&C. |

Note: Cash & Carry (C&C) must be both cash - check or green backs, and carry - to take with them. If either is not used, the price goes up to regular price.

Arrangements: retail price on board includes:

| | |
|---|---|
| 2.00 | labor |
| 2.50 | handling and delivery |
| 1.50 | container |
| $6.00 | |

This $6.00 amount, when subtracted from the total, gives you the base price or cost of the cut flowers only.

Price for a dozen is as marked on board.

Prices for other than dozen price as follows:

| | |
|---|---|
| Price of flowers per dozen | 12.00 |
| Subtract labor, del. & hand. | 6.00 |
| | $6.00 |

Divide this amount by 12 (one dozen) to get the price of each flower.

If you have a ½ dozen arrangement; take you each price X 6, then add labor, del. cont. and hand. back in.

If the price is an odd amount, round it up to the next 50¢ price.

If the amount of flowers is over 12.00, add 1.00 for extra labor.

Boxed: boxed price is 1.00 off the board price.

Example - 25.00 dozen rose arrangement
-1.00
$24.00 dozen boxed.

½ dozen boxed - 25.00 dozen
-1.00
24.00
-6.00 to get base price per dozen
18.00
÷ 2
9.00 per ½ dozen
+6.00
15.00 for ½ dozen boxed

## RETAIL FLOWERSHOP OPERATION

### EXAMPLE 2 con[illegible]

You add the six dollars back in after you have figured the base price because, if you divided the original 24.00 straight in half, the labor, delivery, box, water picks, ribbon, etc. would also be divided in half. After the final price is decided upon the 2.50 C&C can be subtracted if applicable.

Bud Vases: 5.50 for the first rose plus the cost of the container.

In other words:
2.00 rose
1.00 labor
2.50 delivery
$5.50
+Container

Note: In any arrangement, planter, bud vase, etc. if a container is selected it must be worked into the price. Subtract 1.50 for the regular container from the total price and add the cost of the selected container.

# RETAIL FLOWERSHOP OPERATION

## UNIT 1

### ASSIGNMENT SHEET #1--WIRING TECHNIQUES

Using the list of cut flowers from Unit I "Uses and Characteristics of Flowers and Materials", determine the proper wiring technique for each flower.

# RETAIL FLOWERSHOP OPERATION

## UNIT 1

## JOB SHEET #1: Make a Horizontal Design Arrangement

I Equipment and Materials Needed:

- A. Baker fern - 6 pieces
- B. Cattails - 6 pieces
- C. Wheatstraw - 6-10 pieces
- D. Yellow Pompons - 6 stems
- E. Bronze Pompons - 6 stems
- F. Container - Low flat
- G. Foam

II Procedure:

- A. Design it so it can be viewed from all sides.

## RETAIL FLOWERSHOP OPERATION

### UNIT 1

### JOB SHEET #2: Determine Materials Needed and Construct an arrangement

Step 1: Decide **what** type or design arrangement you want to construct.

Step 2: Sketch a pencil drawing of design you wish to construct.

Step 3: Develop a list of materials needed:

Foliage
Flowers
Decorative Materials
Container
Holding Device

Step 4: Consult with your instructor. With your instructor's help, obtain the materials and construct the arrangement.

# RETAIL FLOWERSHOP OPERATION

## UNIT 1

## JOB SHEET #3: Shoulder Corsage Construction

Step 1: Design and sketch a shoulder corsage

Step 2: Develop a list of materials - Foliage, flowers, wire, ribbon, pins, etc.

Step 3: Check with instructor.

Step 4: Obtain materials and construct the corsage.

## RETAIL FLOWERSHOP OPERATION

### UNIT 1

### JOB SHEET #4: Bow Making

Step 1: Select proper material and construct a bow for a shoulder corsage. Turn in finished bow to instructor for grade and comments.

Step 2: Select proper materials and construct a bow for use in pot dressing. Turn in finished bow to instructor for grade and comments.

# RETAIL FLOWERSHOP OPERATION

## UNIT 1

## JOB SHEET #5: Boutonnieres

Step 1: Select proper flower and other materials and construct a boutonniere. Turn into instructor for grade and comments.

RETAIL FLOWERSHOP OPERATION

UNIT 1

## JOB SHEET #6: Decorating a Flowering Pot Plant

Step 1: Obtain necessary materials for activity:

Potted Plant
Decorative foil
Ribbon
Wire
Wooden Pick

Step 2: Dress Plant - put foil on pot.

Step 3: Face Plant

Step 4: Place bow on pick and insert on face side of plant.

Step 5: Turn into instructor for grade and comments.

# RETAIL FLOWERSHOP OPERATION

## UNIT 1

## JOB SHEET #7: Pricing an Arrangement

For the described arrangements below determine the price of each:

Flower costs at $4.00 for each arrangement.
Container and holding device costs at 1.00 for each.
Labor figured at 3.00 an hour.
Delivery at 2.50 per delivery.
Sales tax at 4% or .04¢ for each dollar.

1. An arrangement to be picked up at the shop. Takes 20 minutes to make.
2. An arrangement using customers container and a 50¢ holding device. To be picked up. Takes 30 minutes to make up.
3. An arrangement called in to another shop in Texas for a customer. Arrangement there will be 12.00 delivered. Operator tells you the call will run 90¢.
4. An arrangement with accessories costing $2.50 to be delivered. Takes 40 minutes to make up.
5. Customer wants two identical arrangements each to include special accessories costing $2.00 each. Takes one hour to make both up. To be picked up.

# RETAIL FLOWERSHOP OPERATION
## UNIT 1
## TEST

1. Define:
    a. Boutonniere -
    b. Facing -
    c. Horizontal -
    d. Perpendicular -
    e. Scale -
2. List the four basic techniques in construction of an arrangement:
    a.
    b.
    c.
    d.
3. List two common types of corsages:

4. List four principles of design for a corsage:
    a.
    b.
    c.
    d.
5. List three methods of wiring flowers for corsage work:
    a.
    b.
    c.
6. List the four basic techniques of construction for a corsage:
    a.
    b.
    c.
    d.
7. List four of the items that help determine the price of an arrangement:
    a.
    b.
    c.

## UNIT 1

## TEST

8. Describe how to "face" a flowering pot plant.

9. Perform Job Sheet 1 to the satisfaction of the instructor.
10. Perform Job Sheet 2 to the satisfaction of the instructor.
11. Perform Job Sheet 3 to the satisfaction of the instructor.
12. Perform Job Sheet 4 to the satisfaction of the instructor.
13. Perform Job Sheet 5 to the satisfaction of the instructor.
14. Perform Job Sheet 6 to the satisfaction of the instructor.
15. Perform Job Sheet 7 to the satisfaction of the instructor.

# RETAIL FLOWERSHOP OPERATION

## UNIT 1

## ANSWERS TO TEST

1. a. -Flower worn by a man.
   b. -Refers to the plants' most attractive side.
   c. -Parallel to the ground.
   d. -Upright or Vertical.
   e. -Relationship in size of one part of a corsage to other parts.

2. a. Prepare Container
   b. Establish Lines
   c. Establish the focal point
   d. Fill in

3. (Any two of the following in any order. Similar wording okay if instructor approves).
   a. Shoulder
   b. Waist
   c. Wrist
   d. Worn in Hair

4. (Any four of the following in any order. Similar wording okay if instructor approves).
   a. Security
   b. Scale
   c. Compactness
   d. Focal Point
   e. Balance
   f. Weight

5. (Any three of the following in any order. Similar wording okay if instructor approves).
   a. Piercing
   b. Clutchwire
   c. Hook Wire
   d. Hairpin

6. a. Wire and tape each flower
   b. Add backing to each flower
   c. Assemble
   d. Finish.

## UNIT 1

## ANSWERS TO TEST

7. (Any four of the following in any order. Similar wording okay if instructor approves).

a. Flowers

b. Container & Holding device

c. Labor

d. Delivery

e. Accessories Used

f. Sales Tax

g. Phone cost if applicable

8. Find the most attractive side of the plant.

9. Job on Job Sheet 1 performed to instructor's satisfaction.

10. Job on Job Sheet 2 performed to instructor's satisfaction.

11. Job on Job Sheet 3 performed to instructor's satisfaction.

12. Job on Job Sheet 4 performed to instructor's satisfaction.

13. Job on Job Sheet 5 performed to instructor's satisfaction.

14. Job on Job Sheet 6 performed to instructor's satisfaction.

15. Job Sheet 7 Answers:
    1. $6.24
    2. $6.24
    3. $12.90
    4. $12.48
    5. $17.68

# RETAIL FLOWERSHOP OPERATION

## UNIT 2

## USING FLOWER ARRANGEMENTS

### TERMINAL OBJECTIVES

Upon completion of this unit, students will be able to define terms referring to use of flower arrangements, be able to list the uses of floral materials and describe the occasions for which certain flowers are used. This objective will be considered achieved upon attainment of a score of at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Match terms related to use of floral designs.
2. List two reasons why florists need to know about flowers.
3. List three major areas in which flowers are used.
4. List four things a florist should know about home use of flowers.
5. List two things a florist should know about flowers used in business.
6. List three things a florist should know about wedding flowers.
7. List three things a florist should know about funeral flowers.
8. List two things a florist should know about Special Date Flowers.
9. List four special occasion dates and appropriate flowers for each.
10. List two other occasions a florist should know concerning flower use.

## RETAIL FLOWERSHOP OPERATION

## UNIT 2

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information Sheets
3. Discuss Terminal and Specific Objectives
4. Discuss Information Sheets
5. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Test
4. Answers to Test

References:

1. Retail Flowershop Operation and Management, The Pennsylvania State University, College of Agriculture, Agricultural Experiment Station, Department of Agricultural Education, University Park, Penn, 1968.
2. Pfahl, Peter, The Retail Florist Business; The Interstate Printers and Publishers, Inc., Danville, Illinois., 1973.

# RETAIL FLOWERSHOP OPERATION

## UNIT 2

## INFORMATION SHEET

I. Terms and Definitions.

   A. Decor - A decoration scheme including color and style.

   B. Contract - An oral or written agreement to buy and sell a commodity or service.

   C. Etiquette - Social conduct or rules of conduct.

   D. Appropriate - Suitable or compatible.

II. Florist's Knowledge of Flowers.

   A. Flowers are used for many special occasions.

   B. A florist should know these occasions and flowers or arrangements useful for each.

   C. This knowledge allows a florist to sell many flowers as well as to improve customer service.

III. Uses.

   A. Home use of flowers.

   B. Flowers in business.

   C. Flowers for weddings.

   D. Flowers for funerals.

   E. Flowers for special dates.

   F. Flowers for other occasions.

IV. Home Use of Flowers.

   A. A table centerpiece is the most popular arrangement for the home.

   B. Consider the decor of the entire room.

   C. Season or occasion may suggest design to use.

   D. Use low horizontal design for dining tables and coffee tables.

   E. **Mantel** or against a wall arrangement are one sided.

   F. Dining, coffee table or those placed against a mirror are seen from all sides.

   G. Flowering and foilage pot plants are very popular in the home.

   H. **Dried** arrangements are used for fall and winter months.

(NOTE: Additional information see Chapter 30, "Home Decorations and Table Arrangements", Pfahl, The Retail Florist Business.)

## INFORMATION SHEET

V. Flowers in Business:

  A. Many stores use arrangements in show windows.

    1. Cut flower arrangements.

    2. Live plants.

    3. Dried materials.

  B. Planters used as dividers and traffic control.

  C. Florist may service and maintain such displays on a monthly or yearly basis.

  D. Stores also use arrangements to attract attention at store openings or in displaying new products.

  E. Some stores contract for holiday decorations.

VI. Flowers for Weddings.

  A. Provide a major source of business for some florists.

  B. Usually calls for a large number and variety of flowers.

  C. Arrangements are used to decorate: church, altar, reception room, and home.

  D. Flowers are used for special luncheons and receptions for the bride.

  E. Bouquets, corsages and boutonnieres are standard wedding items.

  F. Florist may have to create special designs for each wedding.

  G. Florist must know religious and social customs in order to plan weddings.

  H. Florist may be asked to give advice on wedding procedure and etiquette.

(NOTE: Additional information see Chapter 34 in Pfahl, The Retail Florist Business, and/or see Chapter 21-29 in Benz, Flowers, Geometric Form.)

VII. Flowers for Funerals.

  A. May account for 35 to 75 per cent of a florists business.

  B. Usually arranged as baskets, vases, wreathes, sprays and casket cover.

  C. Designs and flowers should create a feeling of gentleness and quiet dignity.

  D. Colors are soft and not clashing.

  E. Florist should know some things about the person who has died.

    1. Sex

    2. Age

    3. Religion

    4. Customs of their people.

(NOTE: For more information see Chapter 32, Pfahl, The Retail Florist Business)

## INFORMATION SHEET

VIII. Flowers for Special Dates.

A. Florists try to determine ahead of time the demand for these occasions.

B. Extra help is often needed for these occasions.

C. Florists and help work late hours before and after these occasions.

D. Partial list of special occasions and appropriate flowers.

### IX. Special Occasion Dates and Appropriate Flowers For Each

| | |
|---|---|
| New Year's Day | Roses and Carnations |
| Valentine's Day | Violets, Roses, and Carnations |
| St. Patrick's Day | Green Carnations, Shamrock Plants |
| Easter Sunday | Easter Lilies, Azaleas |
| Easter (Orthodox Churches) | Easter Lilies |
| Jewish Passover | No Special Flower |
| Secretaries' Day | Roses, Carnations, and Orchids |
| Mother's Day | Roses, Carnations, and Orchids |
| Memorial Day | Gladioli, Peonies |
| Father's Day | Roses |
| Jewish New Year | No Special Flower |
| National Flower Week | Roses, Carnations, Snapdragons, Gladioli, Chrysanthemums |
| Thanksgiving Day | Chrysanthemums |
| Christmas Day | Roses, Carnations, Poinsettia, Evergreen Foliages |
| Mothers-in-law Day | No Special Flower |

X. Flowers for other occasions.

A. Used for dances, home-coming, banquets and dedication ceremonies.

B. Used at conferences and church services.

C. Used as gifts to friends that are ill or hospitalized.

D. Given on anniversaries and birthdays.

E. Flowers are given simply as an expression of affection.

# RETAIL FLOWERSHOP OPERATION

## UNIT 2

## TEST

1. Match the terms on the right to the correct definitions.

| | |
|---|---|
| _____a. Appropriate | 1. A decoration scheme including color and style. |
| _____b. Contract | 2. Social conduct or rules of conduct. |
| _____c. Decor | 3. An oral or written agreement to buy and sell a commodity or service. |
| _____d. Etiquette | 4. Suitable or compatible. |

2. List two reasons for a florist knowing about flowers.

3. List three major areas flowers are used.

4. List four things a florist should know about home use of flowers.

5. List two things a florist should know about use of flowers in business.

6. List three things a florist should know about wedding flowers.

7. List three things a florist should know about use of funeral flowers.

8. List two things a florist should know about Special Date Flowers.

9. List four special occasion date and appropriate flowers for each.

10. List two other occasions a florist should know about flower use.

# RETAIL FLOWERSHOP OPERATION

## UNIT 2

## ANSWERS TO TEST

1. a. 4
   b. 3
   c. 1
   d. 2

2. (Any two of the following are approprîate)
   -Flowers are used for many special occasions.
   -Florists should know the occasions and flowers used.
   -Allows florist to sell many flowers and improve customer service.

3. (Any three of the following are appropriate)
   -Home use.
   -Business use.
   -Wedding work.
   -Funeral work.
   -Special dates.
   -Other occasions.

4. (Any four of the following are appropriate)
   -Table centerpeice most popular.
   -Consider decor of entire room.
   -Consider season or occasion.
   -Use horizontal designs for dining and coffee tables.
   -**Mantel** or against wall arrangements are one sided.
   -Dining and coffee table arrangements and those against mirrors are seen on all sides.
   -Flowering and foliage plants are popular.
   -Fall and winter dried arrangements are popular.

5. (Any two of the following are appropriate)
   -Use arrangements in show windows.
   -Use for traffic control and dividers.
   -To attract attention.
   -Contract for holiday decorations.

## ANSWERS TO TEST

6. (Any three of the following are appropriate)
   - -Can be a major source of business.
   - -Usually calls for a large number and variety of flowers.
   - -Used to decorate church, altar, reception room and home.
   - -Used at special luncheons and receptions for bride.
   - -Bouquets, corsages and boutonnieres are standard items.
   - -May have to create special designs.
   - -Must know religious and social customs.
   - -Must know wedding procedure and etiquette.

7. (Any three of the following are appropriate)
   - -Account for 35 to 75 per cent of business.
   - -Common arrangements are baskets, vases, wreathes, sprays and casket covers.
   - -Designs should create a feeling of gentleness and quiet dignity.
   - -Use soft non clashing colors.
   - -Florist should know about person who died.

8. ( Any two of the following are appropriate.)
   - -Try to determine demand in advance.
   - -May need extra help.
   - -Work late hours before and on these occasions.

9. See Item IX, Information Sheet, p.5.

10. (Any two of the following are appropriate.)
    - -School occasions.
    - -Church Services.
    - -Gifts to ill or in hospital.
    - -On anniversaries or birthdays.
    - -As an expression of affection.

# RETAIL FLOWERSHOP OPERATION

## UNIT 3

## MERCHANDISING AND SELLING

### TERMINAL OBJECTIVES

Upon completion of this unit, students will be able to define terms related to merchandising and selling, to list areas involved in merchandising and selling, and be able to identify the basic areas related to merchandising and selling. This objective will be considered achieved upon attainment of a score of at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

Upon completion of this unit, students will be able to:

1. Define terms related to merchandising and selling.
2. List the three main areas of merchandising.
3. List four areas covered by buying.
4. List four of the items upon which retail prices are based.
5. List what items are included in total costs.
6. List two points to consider when planning advertising.
7. List five media for advertising.
8. List two main types of selling in a floral shop.

# RETAIL FLOWERSHOP OPERATION

## UNIT 3

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information Sheets
3. Discuss Terminal and Specific Objectives
4. Discuss Information Sheets
5. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Test
4. Answers to Test

References:

Retail Flowershop Operation and Management, The Pennsylvania State University, College of Agriculture, Agricultural Experiment Station, Department of Agricultural Education, University Park, Penn., 1968.

Pfahl, Peter, The Retail Florist Business, The Interstate Printers and Publishers, Inc., Danville, Illinois, 1973.

Florists' Review, Florists' Publishing Company, 310 Michigan Ave., Chicago, Illinois, 60604.

Florist, Florists' Transworld Delivery Association, 29200 Northwestern Highway, P.O. Box 2221, Southfield, Michigan, 48037.

# RETAIL FLOWERSHOP OPERATION

## UNIT 3

## INFORMATION SHEET

I. Terms and Definitions

   A. Merchandising - The steps from purchase to sale

   B. Advertising - Offering a product to the consumer which results directly in selling merchandise

   C. Displaying - To place on public view

   D. Effective - That which brings about a desired result

   E. Promotion - To create a desire for something

   F. Markup - To establish a price based on cost

   G. Profit - What is left after all costs have been deducted from the selling price

   H. Perishable - Does not last long

   I. Staples - Non-perishable items for use and for sale

II. Main Areas of Merchandising

   A. Select

   B. Pricing retail goods

   C. Advertising

III. Buying

   A. Perishable Merchandise

      1. Need good quality

      2. Fair prices

      3. Study past records to determine expected demand

      4. Know seasons available for different flowers

      5. Prices determined by supply and demand

   B. Non-perishable Items

      1. Select items that will move in shop (sales appeal)

      2. Buy enough

      3. Know when to buy

      4. Take advantage of cash discounts when possible

## INFORMATION SHEET

- C. Staples (Wire, ribbon, papermache, containers, floral tape, etc.)
    - 1. The larger the quantity, the better the price (need storage space)
    - 2. Take advantage of prompt payment discounts
- D. Equipment and Fixtures
    - 1. Buying new or used is determined by need
    - 2. Depreciate and set aside money for replacement
    - 3. Prompt payment may cause a discount

IV. Pricing Retail Prices are Usually Based on One or a Combination of the Following:

- A. Supply and demand
- B. Wholesale price
- C. Total cost
- D. Prices used by competing florists
- E. Prices based on volume

V. Total Costs Include:

- A. Wholesale price
- B. Overhead
    - 1. Rent
    - 2. Interest on investment
    - 3. Insurance
    - 4. Taxes

VI. Advertising

- A. Points to Consider when Planning Advertising
    - 1. The area to be covered with the ad
    - 2. The cost in relation to the expected return
    - 3. How much to spend
    - 4. The age and reputation of the store
    - 5. Location of the store
    - 6. When to advertise
    - 7. Determine the long and short range objectives

## INFORMATION SHEET

B. Media for Advertising
  1. Window display
  2. Newspaper ads
  3. Direct mail
  4. Radio
  5. Television
  6. Store front sign
  7. Sign on truck
  8. Yellow pages
  9. Sheet car, subway and bus ads
  10. Outdoor billboards
  11. Magazines
  12. Motion picture houses
  13. Organizational magazines
  14. Flowers
  15. Word of mouth
  16. Phone call reminders
  17. Cooperative ads

VIII. Selling:

A. In shop sales
  1. Greet the customer
  2. Identifying customer needs and desires
  3. Showing the flowers (giving the customer facts about the products)
  4. Completing the sale

B. Selling by phone

Up to seventy five per cent of all sales are made by phone

# RETAIL FLOWERSHOP OPERATION
## UNIT 3
## TEST

I. Define:

- A. Advertising -
- B. Displaying -
- C. Effective -
- D. Mark-Up -
- E. Merchandising -
- F. Perishable -
- G. Profit -
- H. Promotion -
- I. Staples -

II. List the three main areas of merchandising.

III. List the four areas covered by buying.

IV. List four of the items used to base retail prices upon.

V. What items are included in total cost?

VI. List two points to consider when planning advertising.

VII. List five media for advertising.

VIII. What are the two main types of selling in a floral shop?

# RETAIL FLOWERSHOP OPERATION

## UNIT 3

## ANSWERS TO TEST

I. A. Offering a product to the consumer which results directly in selling merchandise

B. To place on public view

C. That which brings about a desired result

D. To establish a price based on cost

E. The steps from purchase to sale

F. Does not last long

G. What is left after all costs have been deducted from the selling price

H. To create a desire for something

I. Non-perishable items for use and for sale

II. Select, pricing retail goods, and advertising

III. Perishable merchandise

Non-perishable items

Staples

Equipment and fixtures

IV. Any four of the following:

Supply and demand

Wholesale price

Total cost

Prices used by competing florists

Prices based on volume

V. Wholesale price

Overhead

VI. Any two of the following:

The area to be covered with the ad

The cost in relation to the expected return

How much to spend

The age and reputation of the store

Location of the store

When to advertise

Determine the long and short range objectives

## ANSWERS TO TEST

VII. Any five of the following:

Window display

Newspaper ads

Direct mail

Radio

Television

Store front sign

Sign on truck

Yellow papes

Sheet car, subway, and bus ads

Outdoor billboards

Magazines

Motion picture houses

Organizational magazines

Flowers

Word of mouth

Phone call reminders

Cooperative ads

VIII. In shop sales

Selling by phone

# RETAIL FLOWERSHOP OPERATION

## UNIT 4

## FLOWERSHOP OPERATION

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to define terms referring to the flowershop operation and to describe the areas of flowershop operation. This objective will be evidenced through demonstration and by scoring at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

Upon completion of this unit, students will be able to:

1. Define terms related to flowershop operation.
2. Describe profit.
3. List the five W's to follow in making sales.
4. List six steps in taking orders.
5. State five telephone sales techniques.
6. List six items that should be filled out on a credit card slip before being put onto the charge card machine.
7. List four items of information needed for accepting checks.
8. List five steps in order filling.
9. List five duties of a floral delivery driver.
10. List a national trade organization and a national delivery organization for florists.

# RETAIL FLOWERSHOP OPERATION

## UNIT 4

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information and Assignment Sheets
3. Make transparency
4. Discuss Terminal and Specific Objectives
5. Discuss Information Sheets and examples
6. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheet
3. Transparency Master
   #1 - Profit Chart
4. Example Forms
   #1 - Charge Card Form
   #2 - Telecheck Guarantee
5. Assignment Sheets
   #1 - Filling Out an Order Form
   #2 - Birthday Order
6. Test.
7. Answers to Test

References:

1. Pfahl, Peter, The Retail Florist Business, The Interstate, Danville, Ill., 1973.

# RETAIL FLOWERSHOP OPERATION

## UNIT 4

## INFORMATION SHEET

I. Terms and Definitions.

- A. Profit - Returns over expenditures.
- B. Gross sales - Total of sales exclusive of deductions.
- C. Sales - The act of getting a customer to purchase.
- D. Will Call - Orders that will be picked up at shop.
- E. Local - Orders to be delivered in general area.
- F. FTD - Florist TransWorld Delivery.
- G. SAF - National Florist organization initials stand for Society of American Florists.
- H. COD - Refers to Cash on Delivery.
- I. C & C - Cash and Carry means customer will pay for and take item with them.

II. Profit: Or why go into business for yourself? (TM-1)

- A. The owner doesn't get to take home all the money that comes into each day. They receive a salary and have access to those profits that they feel can be removed from the shop and not put back in the business.
- B. Sample budget of a business with gross sales of approximately $150,000.
    - 1. Cost of Merchandise - Approximately 45%
    - 2. Labor - Approximately 25 to 30%

      70 to 75%
    - 3. Operating Costs
        - a. Dumpage and waste
        - b. Utilities
        - c. Taxes
        - d. Office management (supplies, equipment)
        - e. Depreciation
        - f. Transportation (delivery)
        - g. Insurance
        - h. Advertising
        - i. Billing, Mailing
        - j. Rent or Mortgage payment

      20 to 25% or more
    - 4. Profit - 5% if all goes well.

## INFORMATION SHEET

III. Sales - Some suggested steps to aid you in sales.

A. Greet customer with enthusiasm (as you would a friend). Don't say "May I help you?" Do say, "What may I help you with?" or "What may I show you?"

B. Follow the 5 W's - Who is it going to; Where are they; When is it going; Why is it going (type of card and signature) What are they sending?

C. Use sales aids - Displays, selection guides, etc. Close the sale. Ask "Which do you want?" Fill order form entirely, all blanks filled in properly. Ask, "May we wrap this for you?", Would you like to take it with you?", etc.

D. Read entire order back to customer.

E. When using credit cards be certain that name, address, and number of customer is imprinted and readable on sales slip. Verify credit card number if necessary.

F. Have the customer sign the order if it is charged and they are in the shop.

G. Thank customer for ordering from the florist, and walk them to the door.

H. Check over order for completeness. (Would you know color, type of flower, container, etc., if you had not taken the order yourself?)

I. If selected container, item, etc., place sales slip and/or identification on article.

J. Put on proper clip in office:

1. Local - Orders going to city or outlying areas that will be delivered by firm.
2. Will Call - Orders that will be picked up at the florist shop.
3. FTD Out - Orders going out of town or that will be transferred to another florist.

(NOTE: Sales Procedures for Certain Items: If you are selling a centerpiece, be sure to determine the theme or color and the time the flowers will be used. Ask how many people will be seated at the table and whether it will be a round or an oblong table. If it is for a buffet, determine if the table will be against a wall so the arrangement should be made one-sided, or if it is going to be centered and guests will walk around the entire table.

If you are taking an order for a specific arrangement other than a centerpiece, determine if it should be one-sided or all around. Also, if the customer has preference in color, or a dislike for certain flower or color, please note it on the order form.

If you are selling a corsage and you do not have a specific flower or color request, be sure to check the color of the dress, coat, or suit or get some idea as to what it might be worn with so that the shop can better satisfy the customer. At all times ...........ASK THE OCCASION.)

## INFORMATION SHEET

IV. Taking Orders

- A. Regular Orders.
    1. Write clearly, and press hard.
    2. Write order completely. (no guesswork-record customer's order)
    3. Read order back to customer.
    4. Spell names and streets out in full.
    5. Customer's telephone number must appear on every order.
    6. Get zip code and apartment number.
    7. Make sure you have billing address as well as delivery address.
    8. Indicate and re-check time and place of funeral service.
- B. Special Orders.
    1. Special orders should be referred to the appropriate sales person or the Sales Supervisor.
        - a. Weddings.
        - b. Family funerals.
        - c. Decoration for special events.

    See Student Handout #1.

(NOTE: After discussing the order with the customer an order form should be written, starting with the 5 W's.

Who - is the order going to?
Where - is the order going?
When - is it to be deliver?
Why - type of card and signature?
Which - of the items you suggested?

Be sure to record anything that is discussed. An open order generally makes an easier order to fill and most often a more satisfactorily filled order.

Some funeral orders require a ribbon. Be sure to include the inscription in the proper place and the relationship of the person to the sender.

If no card is requested, specify this fact in the space where the card inscription goes.

Other items to be filled out are: Delivery date and day, your initials, whether FTD in or out, telephone numbers, etc.

If it is a COD order, write the COD amount on the delivery copy. COD orders should be avoided on holidays. If there is a possibility of a variance in the price, the COD portion should be completed by the designer. Phone orders must be confirmed.)

## INFORMATION SHEET

C. Charge Orders

One copy of the order is to be retained, as the customer will receive this at the time of billing. (NOTE: If the customer needs a copy immediately, you may give him this copy.)

D. Cash Orders

In selling a cash order, be sure to recheck your figures and always refer to the tax chart for the tax charge. Be certain you list each and all items purchased. One copy of the order will serve as the customer's receipt.

E. Charge Card Orders

Be sure the amounts match in all places where it is written on the order and charge card form as well as where imprinted with the machine. Customer name, card number, and expiration date must be on the order as well as the charge card form. Customer receipt is the charge card form marked receipt, not the original copy.

V. Telephone Sales - Everytime you make or receive a business call at work you are representing your company. The impression you make can be a lasting one, so you will want to be sure you sound warm, friendly, courteous and tactful. Remember the following:

A. Answer the telephone promptly.

B. Identify the company and yourself.

C. Be a good listener so the customer won't have to repeat.

D. Be considerate of the customer's time. Do not keep a customer waiting on hold - if necessary, take the customer's number and return the call.

E. Transfer a call only when necessary and then explain why you are doing so. Be sure you are transferring the customer to the proper department.

F. Us the person's name to whom you are speaking.

G. Treat every call as you would a most important call - your personal consideration will win the customer's confidence in you and the company.

H. Be tactful - when it is necessary to refuse a customer's request because of company policy, give a full and sympathetic explanation.

I. Apologize for errors or delays; always be courteous and helpful.

J. Use common courtesy words sincerely and with enthusiasm.

K. Put a mirror near the telephone - and smile!

## INFORMATION SHEET

VI. Credit Cards (Example Form #1)

A. Be certain these items are filled out:

1. Account number
2. Correct sale amount
3. Quantity and description
4. Sales clerk
5. If amount is over $50.00 - authorization code
6. Customer signature - print out from charge card machine
7. Merchant number
8. Date
9. Print out of correct sale amount

B. Telephone orders

1. Be sure T.O. (Telephone Order) is in area for customer signature.
2. Be sure T.O. (Telephone order) is in area for type of sale.

(NOTE: Credit cards are not considered the same as cash for C & C., cash and carry discount.)

VII. Payment by check (Example form #II)

A. Be sure to stamp back of check with the Telecheck stamp at opposite end of imprint.

1. Fill in store code
2. Fill in initial and time.
3. Get two phone numbers - if retired, put that on it.
4. Record the state of drivers license; at the same time compare signature and address.
5. Check to see they have an account.
6. Get check approved. If you are instructed to call Telecheck be sure to record the letter and number the telecheck person gives you.

B. Ring up the sale on the cash register.

1. Before pushing cash button - put check under and imprint the subtotal on the back of the check.
2. Stamp check with "Deposit Only" on opposite end of telecheck information.
3. Be sure to pull numerical copy on all orders rung on register or follow the store policy.

## INFORMATION SHEET

### VIII. Order Filling

A. Procedure for filling an order already taken.

1. Read over carefully and select proper color, type, etc.
2. Check water and add if necessary.
3. Check item and see that it is in proper condition, remove bad foliage. If you doubt quality check with supervisor.
4. Correct guarantee tags, dated with date of delivery attached to item.
5. Check card and envelope for correctness of card type, signature and address of sender on back, write description of color and what type of plant or flower is being sent on back of card.
6. Attach card envelope.
7. Mark order as filled and place in either the delivery box or in Will Call if being picked up at the shop.
8. Will Call: Place item in front of regrigerator if cut flowers.
   Place on proper counter if item is a plant or planter.
9. Wrap item is plastic bag or sleeve if it is will call or is to be delivered to a home or office. This is especially important in the freezing winter months.

B. Item taken by customer at time of the sale.

1. Same procedure as above.
2. Give order and item to cashier in office.
3. Thank the customer and tell them the cashier will give them the receipt.

### IX. Delivery

A. Drivers

1. All drivers are responsible to and report to the dispatcher.
2. Must have clean driving record and valid current driver's license or other licenses as required by state law.
3. Report any and all traffic violations and accidents to dispatcher.
4. Is courteous and neatly attired at all times.
5. Has knowledge of delivery area and the ability to read maps.
6. Has knowledge of proper handling of floral products.
7. Check vehicle daily for gas, oil, water, tire pressure, etc.
8. Keeps vehicle neat, clean, and properly equipped; no beverage cans or other refuse in the vehicle.
9. Reports to dispatcher all maintenance work to be done.

INFORMATION SHEET

10. Makes certain correct package is left at delivery address.
11. Shall perform other duties as assigned by dispatcher when not busy with deliveries.

B.. Delivery Procedures

1. Unauthorized vehicle use, stops, or pickup passengers is not permitted.
2. COD orders are not to be left with customer without payment. If a problem arises, call the Dispatcher at once.
3. Apartment deliveries should be made to the specific apartment designated on the order or to a designated receiving area and signed for.
4. Deliveries to hotels, businesses, clubs, etc., should be received and signed for by an authorized person.
5. If an order is undeliverable, notification as to disposition of delivery must be left with or for the customer, or call Dispatcher at once.
6. Packages returned to the shop must be placed in the assigned area. It is the responsibility of the driver to immediately complete a non-delivery report and give it to the Dispatcher for disposition.
7. During cold weather, protect products from freezing. Do not leave items out of doors. Delivery cars whould be running with heaters on at all times.
8. Careful handling of flowers is most important. Return all damaged packages to the shop and report to Dispatcher.
9. If unable to complete an assigned time delivery, contact the Dispatcher immediately for further instructions.
10. If lost or unable to locate delivery address, call Dispatcher at once. Do not wander around.

X. Florist Organizations

A. The Society of American Florists is a national organization with headquarters in Washington, D. C., which represents all segments of the floral industry on the national level. The society does or has done research, public relations, and some advertising for the industry.

B. The Florist Transworld Delivery Association (FTD), Teleflora Inc., and others were organized to serve the florist. Delivery of flowers is faciliatated between florists in other towns, states, and foreign countries.
One of the latest innovations of FTD is the Mercury Network. Check with your local florist or with FTD about the operation of the program.

# RETAIL FLOWERSHOP OPERATION

## UNIT 4

## STUDENT HANDOUT #1: Special Orders

### FUNERAL ORDERS

Funeral orders should be given every consideration. A family ordering funeral flowers needs your utmost attention and understanding. Only a supervisor or authorized sales clerk should handle these orders. Merely tell the customer that you will ask someone better qualified to take their order immediately and ask someone in charge to assist the customer. Repeating, we, at all times, should try to take orders for stock on hand; if you have other requests, check out the availability of the flower.

### WEDDINGS

Any time during the year you are apt to have customers for wedding flowers. We do not ever tell anyone we are too busy to talk to them about their wedding, even though it may be many months in the future. Refer the customer to a authorized sales clerk or supervisor, who will either book the wedding or make an appointment with the bride. If a Bridal Consultant is not available, refer the bride to someone in the office familiar with making bridal appointments.

### PLANTINGS

Pottery or container plantings should be taken care of by the salesperson. Large planting jobs, company, etc. should be referred to supervisors. If they are not available, designer or one listed in your Department Head Section should talk to the customer.

### FTD (Telegraph orders)

If you have an occasion to take an FTD order, be sure to get all delivery information necessary to complete the delivery. If it is going to an address other than a permanent one, get the name of the person who could accept the order. If you are given a rural route rather than a street address, ask for the recipient's phone number to assist the local florist in making delivery. If you are not thoroughly familiar with taking an FTD order, please ask to have someone more qualified assist the customer. In all instances FTD orders should be encouraged from 10.00 and up. If your customer asks for something less, then tell them that 10.00 allows the receiving florist to take better care of their order and you are sure they would be much happier spending a little more. (We are finding, in calling orders around the country, that seldom does a florist have a Mum plant under 10.00 Roses, etc. at 15.00 and a similar reaction on Cut Flower Arrangements.) In many instances, the customer may like to refer to the Catalog. As you advance in assisting Customers and become qualified to take FTD Orders, be sure to familiarize yourself with the FTD Catalog. Also, as a point of information, FTD flowers are guaranteed. Many times a customer will indicate they are hesitant about order flowers to other cities because they have been disappointed - your first question is, "Did you order from an FTD Florist" and the, "Did you call the Florist?"

# RETAIL FLOWERSHOP OPERATION

## UNIT 4

## STUDENT HANDOUT #2: Guarantees and Complaints

A. Plant Guarantee:

You are the receipient of the finest plant available. It was selected "Expressly for you". It will give added beauty by following the instruction and care below. Please notify us within the guarantee period, if unsatisfactory, whether you purchased it or it was a gift.

This plant is guaranteed 3 days from date. Unfortunately, conditions beyond our control limit replacement to within this period. When satisfactory tell others, if not, PLEASE TELL US AT ONCE for a replacement and mutual satisfaction.

| FOLIAGE PLANTS | BLOOMING PLANTS |
|---|---|
| Let plant dry before watering | Water when received, |
| Place in good indirect light, out of drafts | Keep moist, not soggy |
| Keep foliage clean | Place in bright location |
| Handle little as possible | Keep away from drafts |

DO NOT USE "WATER SOFTENER" WATER!!

B. Cut Flower Guarantee:

This arrangement was designed "Expressly for You" additional days of beauty may be had if you ADD WATER when received and keep filled daily. Do not change the water as a cut flower preservative has been added. Avoid drafts to prevent wilting. If in foam, keep water above foam at all times. This arrangement is guaranteed 24 hours from time marked. Unfortunately, conditions beyond out control limit replacement to within this period. When satisfactory tell others, if not PLEASE TELL US AT ONCE for a replacement and mutual satisfaction.

DATE ___________________.

DO NOT USE "WATER SOFTENER" WATER!!

C. Complaint Procedure:

In the event you get a complaint in the store or over the phone, get the name of the purchaser and telephone number, the recipient's name, date, of delivery, or if it is on delivery and not received, ask for the promised delivery date and kind of merchandise. If they have already received the merchandise, get the order number which is on the delivery tag. Offer to take care of the problem immediately. Give the information to the office, owner or supervisor. A complaint in the store should be handled in the same manner, unless it is something that you can follow through on and satisfy the customer immediately. It is imperative that all complaints are handled quickly, leaving the customer as satisfied as possible.

# RETAIL FLOWERSHOP OPERATION

## UNIT 4

## ASSIGNMENT SHEET #1: Filling out an order form

Complete the order form using this information:

1. Delivery date is tomorrow, don't forget day (Mon., Tues., etc.)

2., 3., & 4. Send to your teacher at school.

5. Card to read "Have a good day" signed with your name.

6. Sending a green plant. (Your choice)

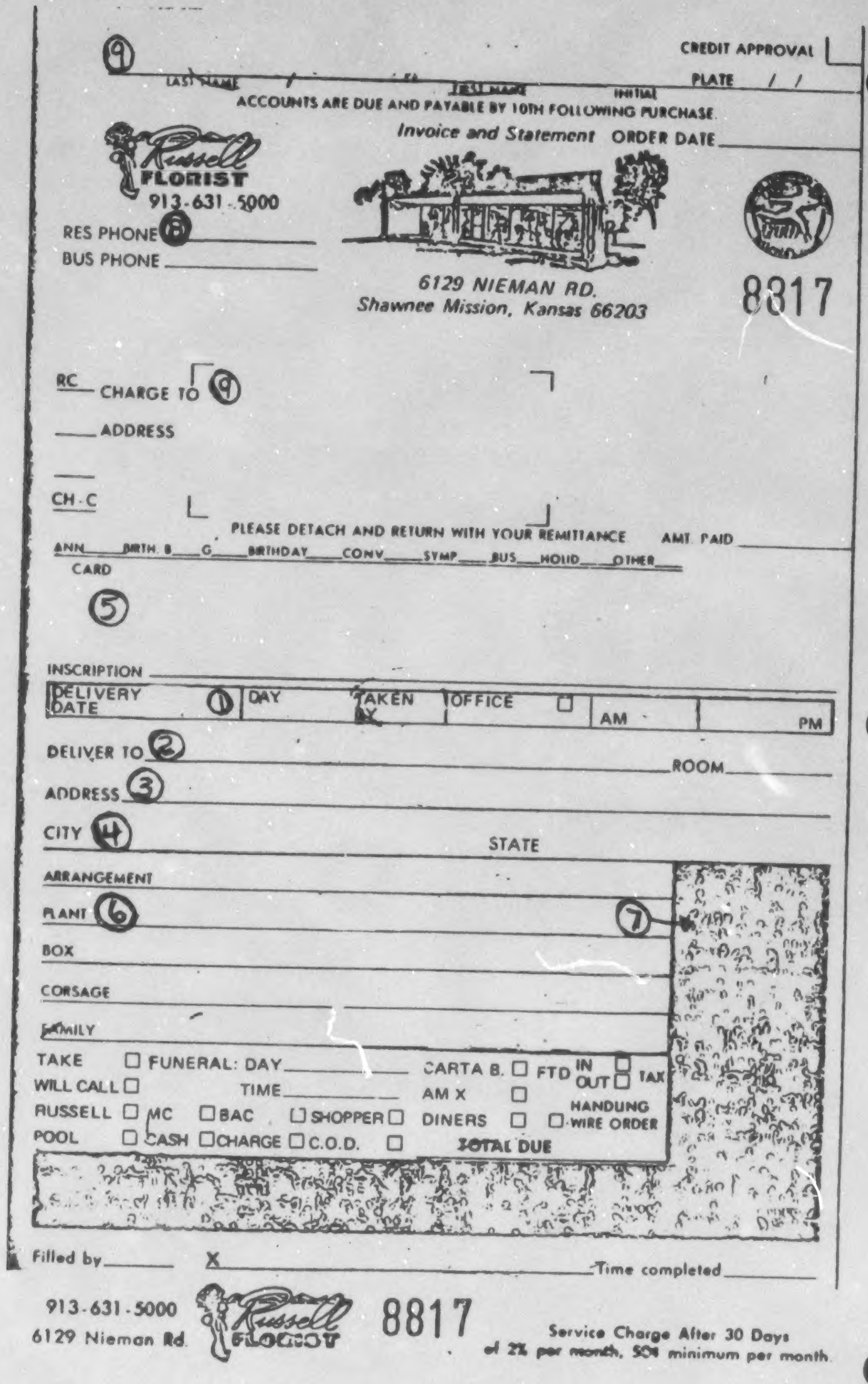
7. Cost of plant is $15.00 + sales tax, this includes delivery.

8. Give your home phone.

9. Give your name and address.

10. Other information: Charge, you have paid $10, total due, your signature at x on bottom line of charge items and any other information your teacher may require.

ASSIGNMENT SHEET #1: Filling Out an Order Form



⑨

LAST NAME FIRST NAME INITIAL

CREDIT APPROVAL

PLATE / /

ACCOUNTS ARE DUE AND PAYABLE BY 10TH FOLLOWING PURCHASE.

Russell FLORIST
913-631-5000

*Invoice and Statement* ORDER DATE ______

RES PHONE ⑧ ______
BUS PHONE ______

*6129 NIEMAN RD.*
*Shawnee Mission, Kansas 66203*

8817

RC ___ CHARGE TO ⑨

___ ADDRESS

___

CH-C

PLEASE DETACH AND RETURN WITH YOUR REMITTANCE AMT. PAID ______

ANN___ BIRTH. B___ G___ BIRTHDAY___ CONV___ SYMP___ BUS___ HOLID___ OTHER___

CARD

⑤

INSCRIPTION ______

| | | | | | |
|---|---|---|---|---|---|
| DELIVERY DATE ① | DAY | TAKEN BY | OFFICE ☐ | AM | PM |

DELIVER TO ② ______ ROOM ______

ADDRESS ③ ______

CITY ④ ______ STATE ______

ARRANGEMENT ______

PLANT ⑥ ______ ⑦

BOX ______

CORSAGE ______

FAMILY ______

TAKE ☐ FUNERAL: DAY ______ CARTA B. ☐ FTD IN ☐ OUT ☐ TAX

WILL CALL ☐ TIME ______ AM X ☐

RUSSELL ☐ MC ☐ BAC ☐ SHOPPER ☐ DINERS ☐ ☐ HANDLING WIRE ORDER

POOL ☐ CASH ☐ CHARGE ☐ C.O.D. ☐ TOTAL DUE

Filled by______ X ______ Time completed______

913-631-5000
6129 Nieman Rd.

Russell FLORIST

8817

Service Charge After 30 Days of 2% per month, 50¢ minimum per month

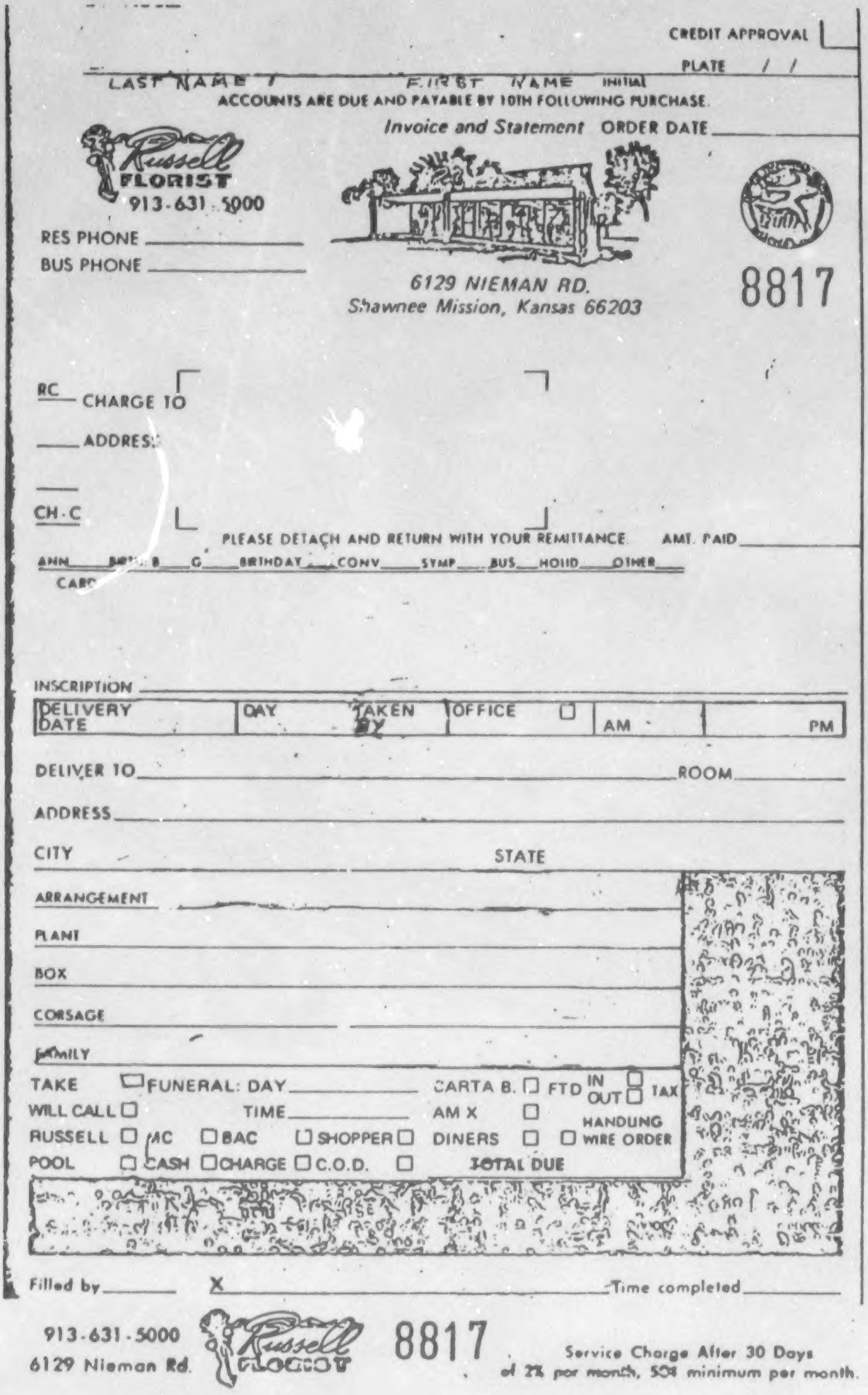
# RETAIL FLOWERSHOP OPERATION

## UNIT 4

## ASSIGNMENT SHEET #2: Birthday Order

Fill out order form using this information:
You are the customer, you are paying cash for the purchase. You are taking the arrangement with you. Use todays date. The arrangement is 6 red roses with greens and baby's breath. Cost is $20 including all taxes. Card to read: Happy Birthday, with your signature.

## ASSIGNMENT SHEET #2: Birthday Order



CREDIT APPROVAL
PLATE / /

LAST NAME FIRST NAME INITIAL

ACCOUNTS ARE DUE AND PAYABLE BY 10TH FOLLOWING PURCHASE.

*Invoice and Statement* ORDER DATE ____

Russell FLORIST
913-631-5000

RES PHONE ____
BUS PHONE ____

6129 NIEMAN RD.
Shawnee Mission, Kansas 66203

8817

RC ___ CHARGE TO
___ ADDRESS
___
CH-C

PLEASE DETACH AND RETURN WITH YOUR REMITTANCE. AMT. PAID ____

ANN ___ BRTH B ___ G ___ BIRTHDAY ___ CONV ___ SYMP ___ BUS ___ HOLID ___ OTHER ___

CARD

INSCRIPTION ____

| | | | | | |
|---|---|---|---|---|---|
| DELIVERY DATE | DAY | TAKEN BY | OFFICE ☐ | AM | PM |

DELIVER TO ____ ROOM ____
ADDRESS ____
CITY STATE

ARRANGEMENT ____
PLANT ____
BOX ____
CORSAGE ____
FAMILY ____

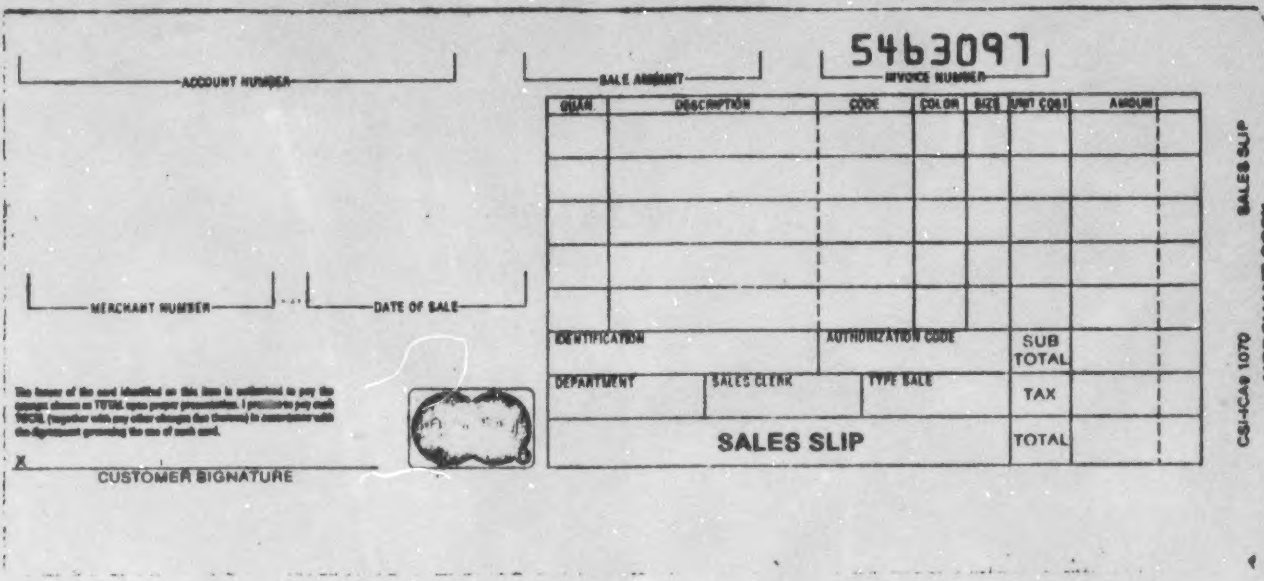
TAKE ☐ FUNERAL: DAY ____ CARTA B. ☐ FTD IN ☐ OUT ☐ TAX
WILL CALL ☐ TIME ____ AM X ☐ HANDLING
RUSSELL ☐ MC ☐ BAC ☐ SHOPPER ☐ DINERS ☐ ☐ WIRE ORDER
POOL ☐ CASH ☐ CHARGE ☐ C.O.D. ☐ TOTAL DUE

Filled by ____ X ____ Time completed ____

913-631-5000
6129 Nieman Rd.
Russell FLORIST
8817

Service Charge After 30 Days of 2% per month, 50¢ minimum per month.

EXAMPLE FORM #1: Charge Card Form



ACCOUNT NUMBER

SALE AMOUNT

5463097
INVOICE NUMBER

MERCHANT NUMBER

DATE OF SALE

X
CUSTOMER SIGNATURE

| QUAN. | DESCRIPTION | CODE | COLOR | SIZE | UNIT COST | AMOUNT |
|---|---|---|---|---|---|---|

IDENTIFICATION

AUTHORIZATION CODE

SUB TOTAL

DEPARTMENT

SALES CLERK

TYPE SALE

TAX

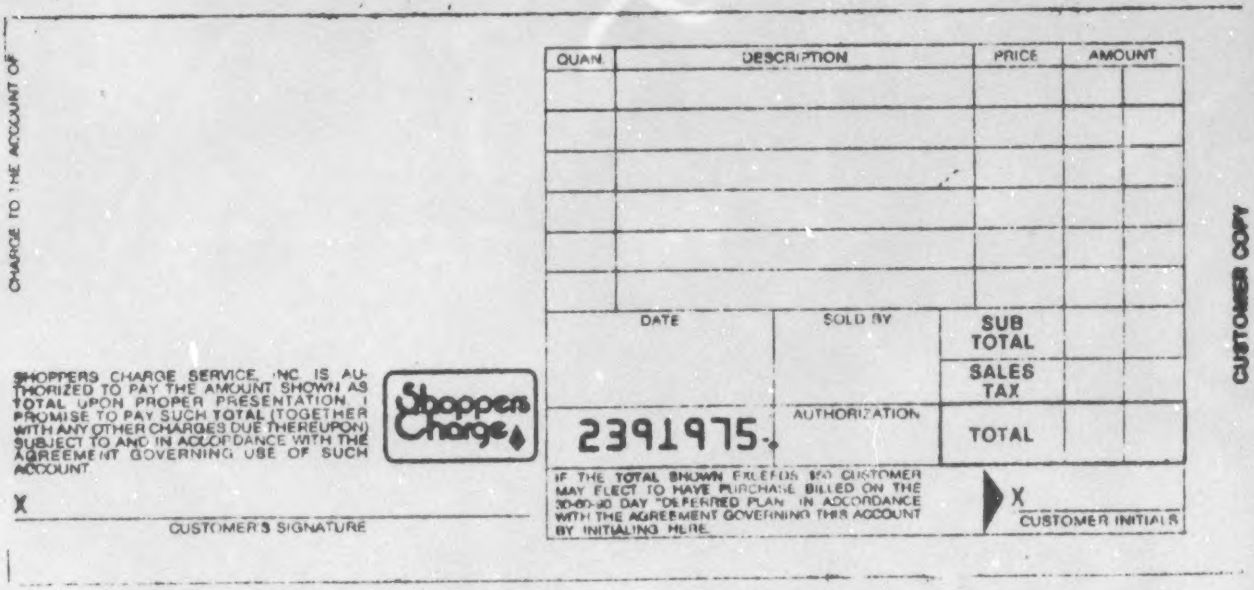
SALES SLIP

TOTAL

SALES SLIP

MERCHANT COPY

CSI-ICA8 1070



CHARGE TO THE ACCOUNT OF

| QUAN. | DESCRIPTION | PRICE | AMOUNT |
|---|---|---|---|

DATE

SOLD BY

SUB TOTAL

SALES TAX

2391975

AUTHORIZATION

TOTAL

SHOPPERS CHARGE SERVICE, INC IS AUTHORIZED TO PAY THE AMOUNT SHOWN AS TOTAL UPON PROPER PRESENTATION. I PROMISE TO PAY SUCH TOTAL (TOGETHER WITH ANY OTHER CHARGES DUE THEREUPON) SUBJECT TO AND IN ACCORDANCE WITH THE AGREEMENT GOVERNING USE OF SUCH ACCOUNT.

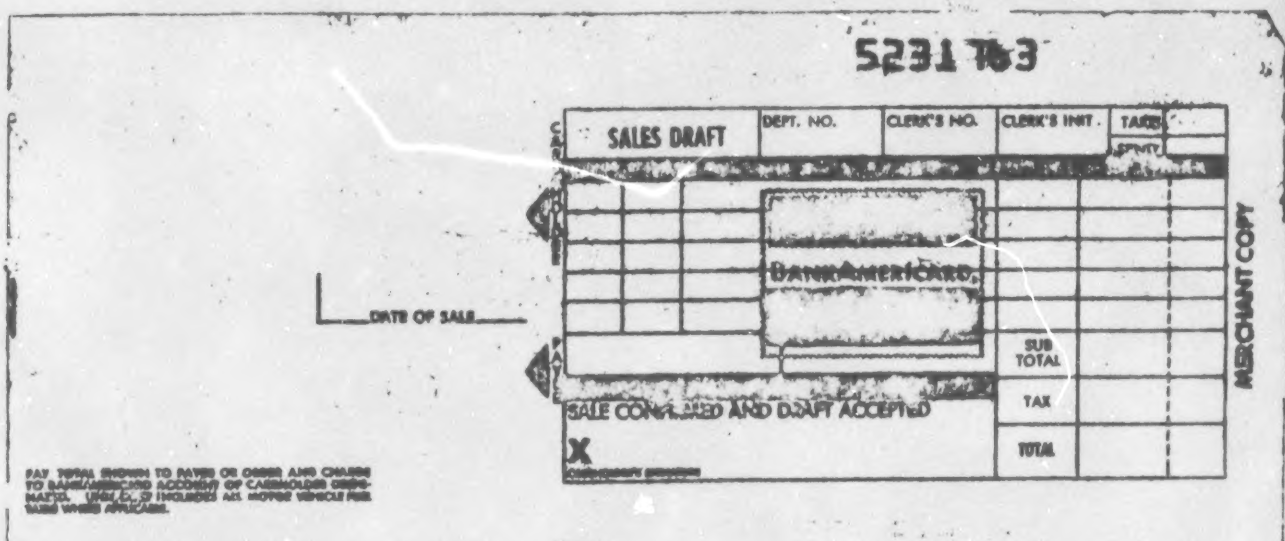
Shoppers Charge

X
CUSTOMER'S SIGNATURE

IF THE TOTAL SHOWN EXCEEDS $50 CUSTOMER MAY ELECT TO HAVE PURCHASE BILLED ON THE 30-60-90 DAY "DEFERRED PLAN" IN ACCORDANCE WITH THE AGREEMENT GOVERNING THIS ACCOUNT BY INITIALING HERE.

X
CUSTOMER INITIALS

CUSTOMER COPY



5231763

SALES DRAFT

DEPT. NO.

CLERK'S NO.

CLERK'S INIT.

TAKEN

BANKAMERICARD

DATE OF SALE

SUB TOTAL

TAX

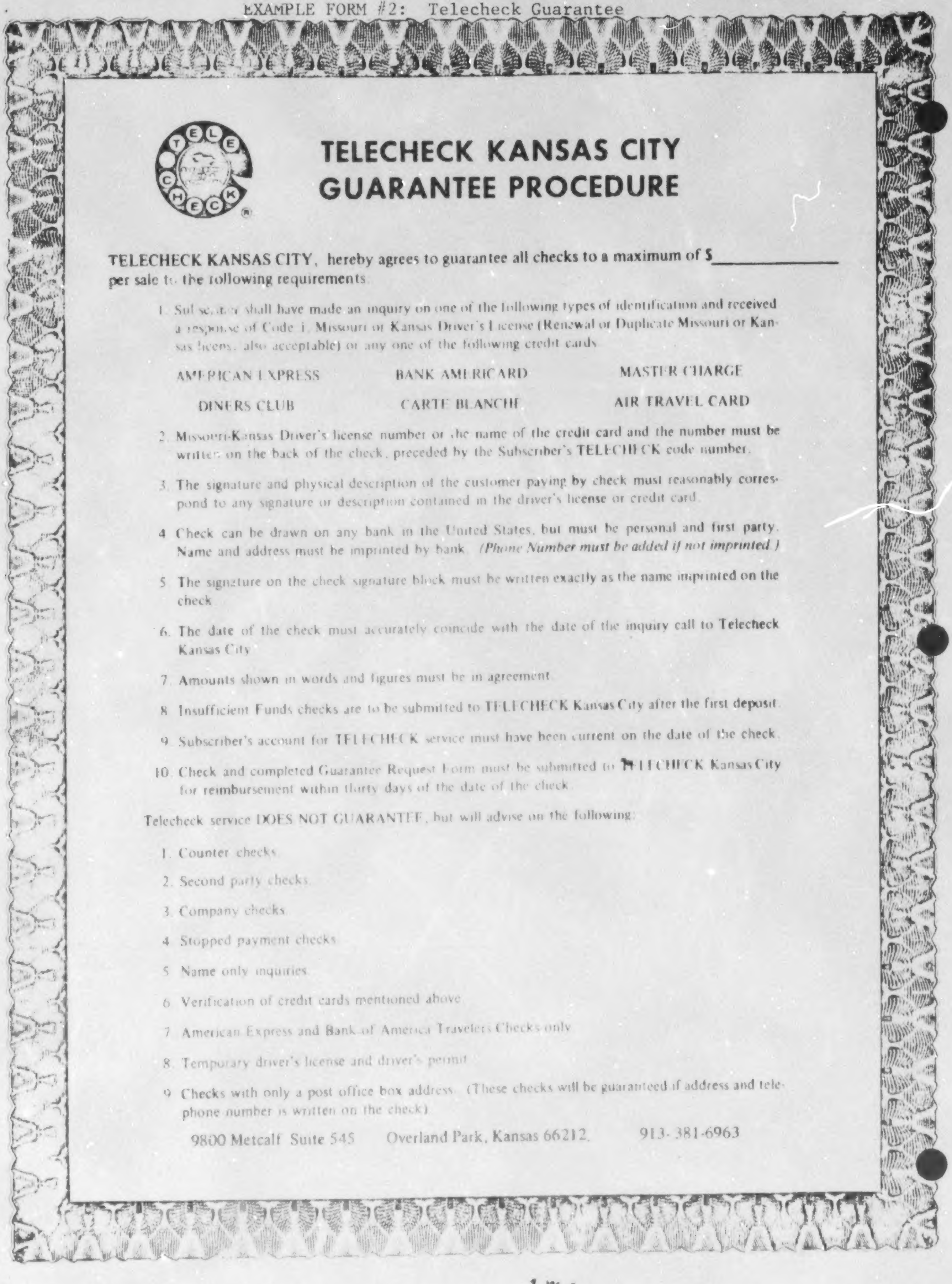
TOTAL

SALE CONFIRMED AND DRAFT ACCEPTED

X

MERCHANT COPY

EXAMPLE FORM #2: Telecheck Guarantee



# TELECHECK KANSAS CITY GUARANTEE PROCEDURE

**TELECHECK KANSAS CITY**, hereby agrees to guarantee all checks to a maximum of $____________ per sale to the following requirements.

1. Subscriber shall have made an inquiry on one of the following types of identification and received a response of Code 1. Missouri or Kansas Driver's License (Renewal or Duplicate Missouri or Kansas license also acceptable) or any one of the following credit cards

| | | |
|---|---|---|
| AMERICAN EXPRESS | BANK AMERICARD | MASTER CHARGE |
| DINERS CLUB | CARTE BLANCHE | AIR TRAVEL CARD |

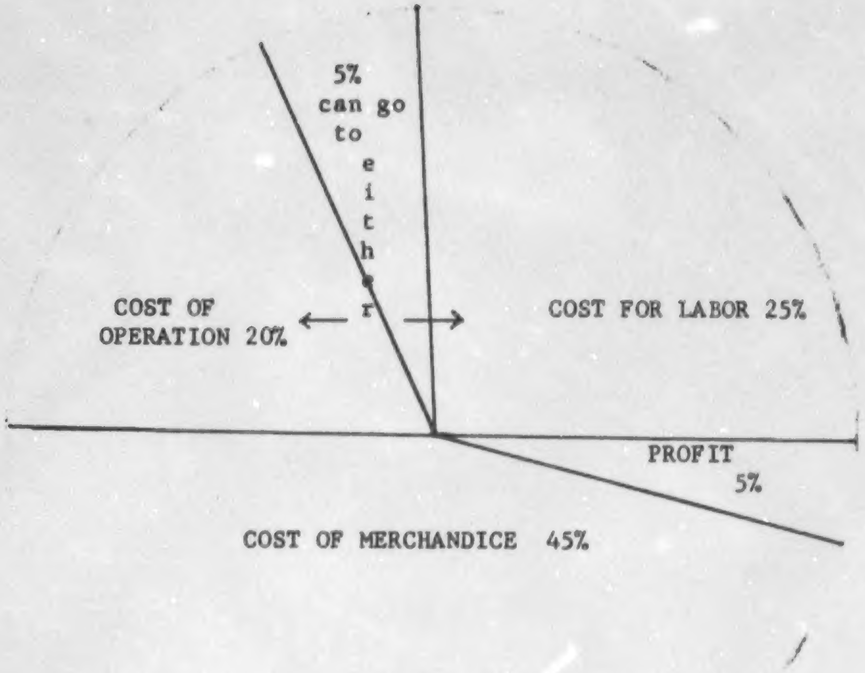
2. Missouri-Kansas Driver's license number or the name of the credit card and the number must be written on the back of the check, preceded by the Subscriber's TELECHECK code number.
3. The signature and physical description of the customer paying by check must reasonably correspond to any signature or description contained in the driver's license or credit card.
4. Check can be drawn on any bank in the United States, but must be personal and first party. Name and address must be imprinted by bank. *(Phone Number must be added if not imprinted.)*
5. The signature on the check signature block must be written exactly as the name imprinted on the check.
6. The date of the check must accurately coincide with the date of the inquiry call to Telecheck Kansas City.
7. Amounts shown in words and figures must be in agreement.
8. Insufficient Funds checks are to be submitted to TELECHECK Kansas City after the first deposit.
9. Subscriber's account for TELECHECK service must have been current on the date of the check.
10. Check and completed Guarantee Request Form must be submitted to TELECHECK Kansas City for reimbursement within thirty days of the date of the check.

Telecheck service DOES NOT GUARANTEE, but will advise on the following:

1. Counter checks.
2. Second party checks.
3. Company checks.
4. Stopped payment checks.
5. Name only inquiries.
6. Verification of credit cards mentioned above.
7. American Express and Bank of America Travelers Checks only.
8. Temporary driver's license and driver's permit.
9. Checks with only a post office box address. (These checks will be guaranteed if address and telephone number is written on the check).

9800 Metcalf Suite 545 Overland Park, Kansas 66212. 913-381-6963

# PROFIT



BASED ON GROSS SALES OF $150,000

# RETAIL FLOWERSHOP OPERATION

## UNIT 4

## TEST

1. Define the following:
    - A. Profit:
    - B. Gross Sales:
    - C. Sales:
    - D. Will Call:
    - E. Local:
    - F. F.T.D.:
    - G. S.A.F.:
    - H. C.O.D.:
    - I. C. & C.:

2. Describe profit:

3. List the five W's to follow in making sales.

4. List six steps in taking orders.

5. State five telephone sales techniques.

6. List six items that should be filled out on a credit card slip before putting it into the charge card machine.

7. List two items of information needed to get check okayed.

8. List five steps in order filling.

9. List five duties of a floral delivery driver.

10. List a national trade organization and a national delivery organization for florists.

# RETAIL FLOWERSHOP OPERATION

## UNIT 4

## ANSWERS TO TEST

1. A. Returns over expenditures.
   B. Total of sales exclusive of deductions.
   C. The act of getting a customer to purchase.
   D. Orders that will be picked up at the shop.
   E. Orders to be delivered in general area.
   F. Florists Transworld Delivery.
   G. Society of American Florists.
   H. Refers to Cash on Delivery.
   I. Cash and carry means customer will pay for and take items with them.

2. Profit is the amount left after Cost of Merchandise, Labor, and Operating Costs have been deducted.

3. Who, Where, When, Why, What?

4. Name of customer
   Order date
   Card and signature
   Deliver or take
   Flowers and/or arrangement
   Cost

5. (List any five of the below in any order).
   1. Each time you answer the phone you are a representative of the company.
   2. Answer phone promptly.
   3. Identify company and yourself.
   4. Be a good listener.
   5. Don't keep customer on hold, better to take number and return call.
   6. Transfer customer only if necessary.
   7. Use person's name.
   8. Each call is important.
   9. Be tactful.
   10. Always be courteous.
   11. Be sincere.

## ANSWERS TO TEST

6. (All six are needed for completed answer).
    1. Account number.
    2. Correct sale amount.
    3. Quantitiy and description.
    4. Sales clerk.
    5. If over $50.00 need authorization code.
    6. Customer signature.

7. (List any two of the below in any order.)
    1. Store code.
    2. Salesperson's initial.
    3. Phone number.
    4. Driver's license number.

8. (List any five of the below in any order.)
    1. Read order carefully and select proper materials.
    2. Check water, add if necessary.
    3. Check item, clean up if necessary.
    4. Check guarantee tag.
    5. Check card against order.
    6. Attach card envelope.
    7. Detach bottom of order and attach guarantee.
    8. Mark order as filled.
    9. Will calls placed in front of refrigerator or on proper counter or shelf.
    10. Wrap if needed.

9. (List any five of the below in any order.)
    1. Driver is responsible to dispatcher.
    2. Have clean driving record and proper license.
    3. Report all traffic violations and accidents.
    4. Be courteous and neat at all times.
    5. Have knowledge of delivery area.
    6. Have knowledge of handling of floral products.
    7. Keep vehicle neat and clean.
    8. Check vehicle daily for gas, oil, water, tire pressure, etc.
    9. Report maintenance work required.

ANSWERS TO TEST

9. Report maintenance work required.
10. Leave correct package at address.
11. Perform other duties as needed.

10. Society of American Florists (National Trade).
FTD, Telaflora (National Delivery).

# LANDSCAPE NURSERY

## UNIT 1

## LANDSCAPE ESTABLISHMENT

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to define the terms used in landscape design, to describe landscape characteristics of balance, sequence, contrast, repetition, and proportion; to specify use of plant material first by shapes, forms, and habit of growth, and later by name. The student will be able to list items that should be on both a new and established checklist before making a landscape sketch or plan for a front foundation planting using the elements of design and proper plantings. This objective will be achieved upon attainment of a score of at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Match terms and definitions pertaining to landscape design.
2. List five basic landscape design elements.
3. State three facts each about symmetrical and asymmetrical balance in the landscape design.
4. Select from given statements those which pertain to sequence in landscape design.
5. List four facts about contrast in landscape design.
6. List three methods used to attain contrast in landscape design.
7. State four facts about plant shapes in landscape design.
8. State two facts about scale of plants in landscape design.
9. List at least five items that should be on a new site checklist before making a landscape plan.
10. List at least five items that should be on an established site checklist before making a landscape plan.
11. Demonstrate the ability to make a landscape sketch or plan by completing Assignment Sheet #1.

# LANDSCAPE NURSERY
## UNIT 1
## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information and Assignment Sheets
3. Make Transparencies
4. Discuss Terminal and Specific Objectives
5. Discuss Information and Assignment Sheets
6. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Complete Assignment Sheet and turn in to instructor
4. Take Test

Optional Enrichment Activities:

1. Tour local area and observe corner, entrance, and base plantings

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Transparency Masters
    - TM 1 - Balance in Landscaping
    - TM 2 - Sequence
    - TM 3 - Contrast
    - TM 4 - Repetition
    - TM 5 - Proportion
4. Assignment Sheets
    - #1 - Landscaping - Front yard planting
5. Test
6. Answers to Test

## SUGGESTED ACTIVITIES

References:

1. Sunset Books, Ed., Sunset Landscaping, Lane Magazine and Book Co., Menlo Park, California, 1975.
2. Van Der Hoeven, Gustaaf A., Residential Landscape Design, Cooperative Extension Service, Kansas State University, Manhattan, Kansas 66506.
3. Nelson, Wm. R., Jr., Landscaping Your Home, University of Illinois, Urbana, Champaign, Illinois.

# LANDSCAPING

## UNIT 1

## INFORMATION SHEET

I. Terms and Definitions.

- A. Focal Point - Center of interest.
- B. Symmetrical - Formal.
- C. Asymmetrical -- Informal
- D. Arborist - One who takes care of trees.
- E. Landscape Design - The art of arranging and fitting together of lands and buildings for human use and enjoyment.
- F. Evergreen - Holding needle type foliage all year.
- G. Deciduous - Leaves out in the spring - drops leaves in the fall.
- H. Broadleaf Evergreen - Wide leaf plant with foliage all year.

II. Some Basic Elements in Landscape Design.

- A. Balance (Formal/Informal)
- B. Sequence (Arrangement)
- C. Contrast (Plant Shapes and Forms)
- D. Repetition or Rhythem
- E. Proportion of Scale

III. Balance in Landscape Design

- A. Symmetrical Balance
  1. Formal garden - Both sides planted alike.
  2. Using a permanent feature as statuary or foundation as a focal point.
  3. If the architecture of the front of the home is balanced then the planting is balanced.
  4. Entrances may be planted with the same plant on either side of the door.
  5. Formal plantings are sometimes stiff and uninteresting.
  6. Easier to plant than unbalanced entrances.
- B. Asymmetrical Balance
  1. Pleasing effect is achieved by using different plants and different amounts on one side from the other but, may be similar in form.
  2. Units of mass, color, texture and size are combined and varied to create a sense of balance.

## INFORMATION SHEET

3. Asymmetrical balance gives direction to the planting, leading the eye to or away from a focal point.
4. An appealing asymmetrical design will have plants of varying masses of textures, sizes, and colors placed in an informal or matural manner, not to the point of destroying unity, but enough so that it is interesting to view.
5. The sweeping and curving lines of an asymmetrical design should be in harmony with a natural setting and easier to maintain.

IV. Sequence in Landscape Design.

1. Refers to a logical order in the placement of plants based on their mature size and their rate of growth.
2. The logical order of arrangement or sequence by properly placing the low, medium and tall shrubs according to their ultimate height.
3. Low shrubs act as "facing down" shrubs for the taller ones.
4. Each shrub is known for being a slow, medium or fast grower. This growth rate of slower shrubs may be increased with proper cultivation, watering and fertilizing.

V. Contrast in Landscape Design.

1. Contrast is desired to break what otherwise might be considered monotonous.
2. Too many contrasting shapes or forms and colors will detract from your focal point.
3. Contrast in plant forms should be gradual and subtle.
4. Plant in groups of a kind rather than one of a kind.
5. Contrast in plant colors should be few and far between.

VI. Some Methods of Attaining Contrast in Landscape Design.

1. Contrast is attained by using plants of different sizes, colors and with different foliage characteristics.
2. Flowers, fall color and fruit will offer contrast for part of the season.
3. Foliage, twigs, and bark are better and more harmonious sources of contrast.
4. Green is a neutral color in the landscape but there are many shades of green.
5. Architectural features give contrast in the landscape as well as boulders, rocks, and bark.

## INFORMATION SHEET

VII. Repetition or Rhythm in Landscape Design.

1. A reappearance of a plant form in the landscape setting.
2. Repetition can easily become monotonous.
3. Repetition can be attained by varying and repeating shapes, colors, and textures in an appealing and inviting way.

VIII. Proportion or Scale in Landscape Design.

1. Art in keeping plants in proper relation to each other.
2. Knowing the ultimate size of the plant using the right plant for the location.
3. Using plants that take pruning and can be kept in scale with the planting.

IX. A New Site Checklist.

1. Has the final grade been completed?
2. Are there slopes too steep for mowing?
3. Is there sufficient top soil for growing?
4. Has all the debris been removed or buried?
5. Check existing plant material for removal.
6. Is the existing material suitable for its location?
7. Is the topography an asset or a liability?

X. Established Site Checklist.

1. Is the lawn a compliment to the property?
2. Check existing trees and shrubs for location and good condition.
3. If shade is a problem, check for use of ground cover in place of lawn.
4. Does the existing material need to be pruned or sheared?
5. Do any of the structural features such as walks, drives, or patios need to be changed?
6. Does the soil need to be be improved or the pH changed?
7. Do utility poles present a problem in the landscape?
8. Is there an easement, if so, will it create a problem for landscaping?
9. Has the soil test been taken.?

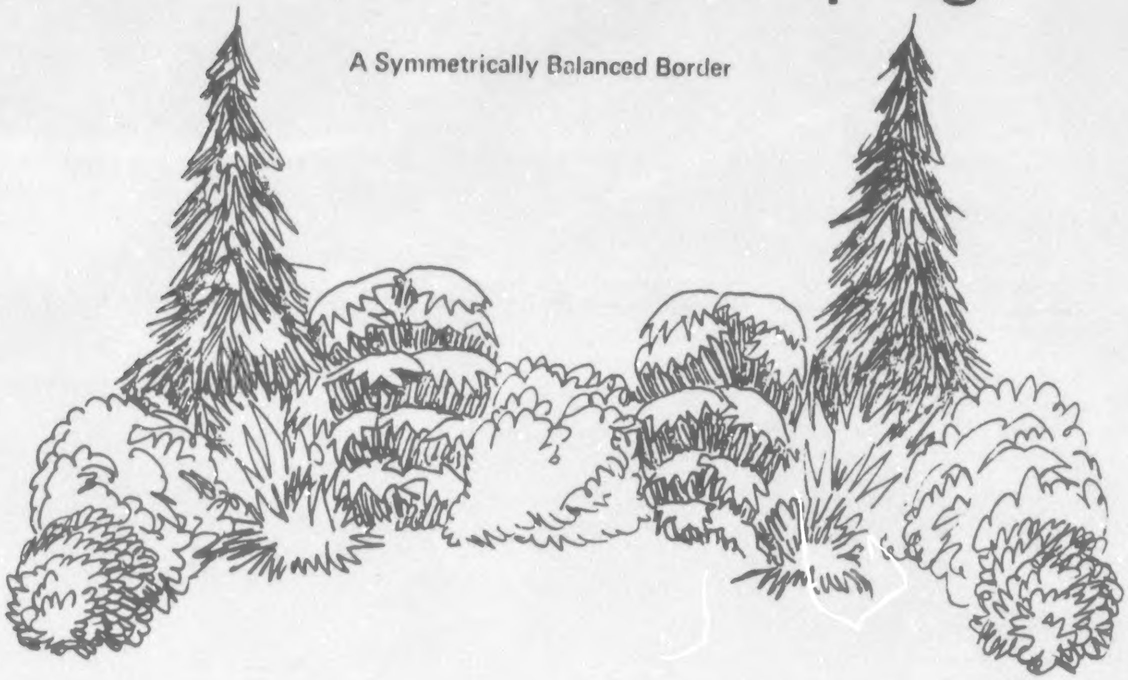
ASSIGNMENT SHEET I : Simplified Landscape plan of an Individual Home Grounds

1. Make a plan to scale of your front yard area.
    - a. Make a site checklist.
    - b. Use the principles and elements of design.
    - c. Work with shapes and forms to show where plants are to go.
    - d. Indicate where you would place low, medium, and tall plants, also if they are upright or spreading.
    - e. Also indicate if the plants are deciduous, evergreen or broadleaf evergreen.
    - f. Describe your plans.

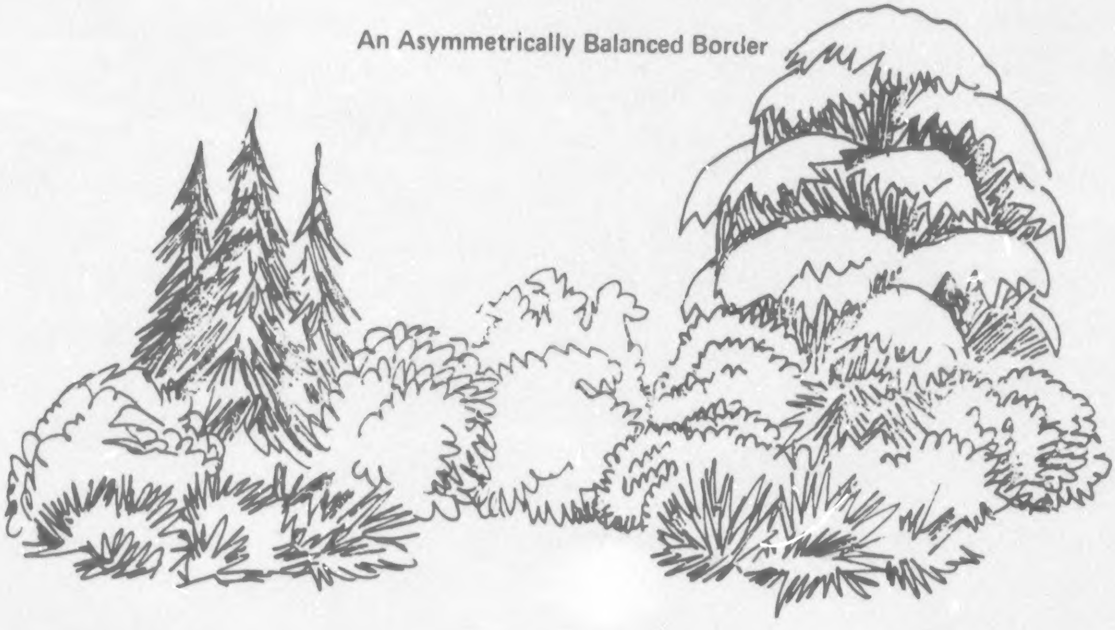
2. Make a sketch of a home and show suggested planting as indicated above.

# Balance in Landscaping

A Symmetrically Balanced Border

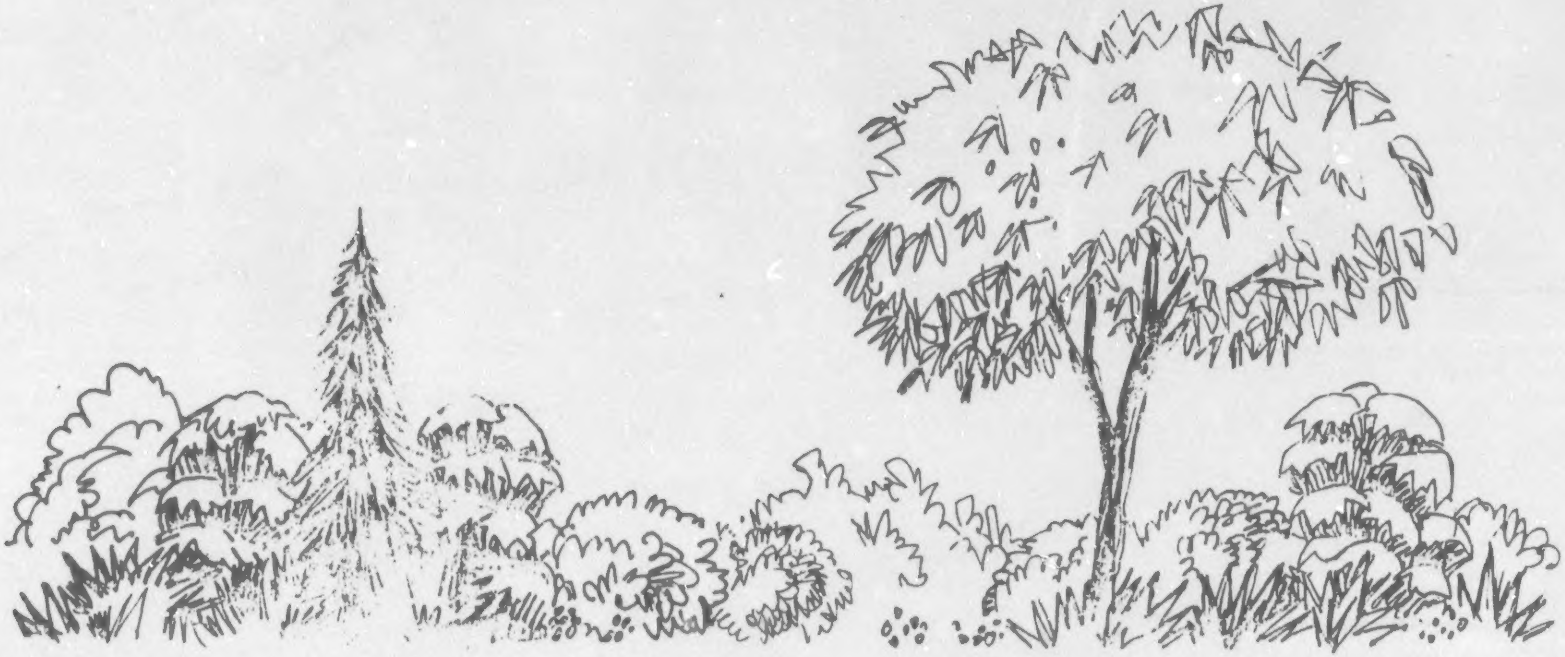


An Asymmetrically Balanced Border



TM 1

# An Example of Sequence

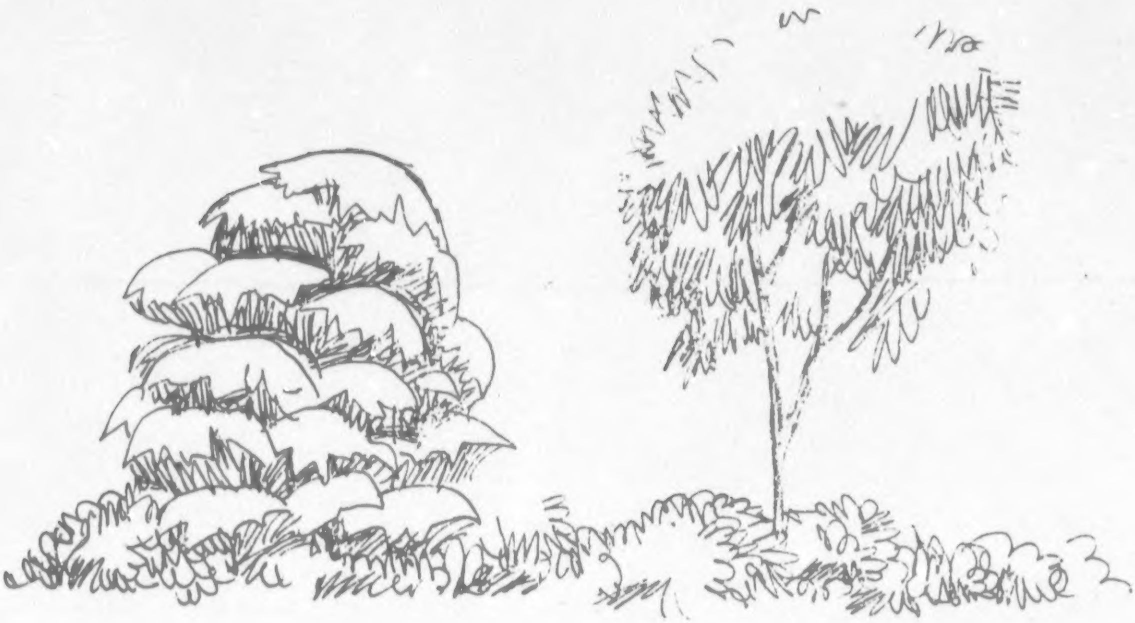


(NOTE: Low objects in foreground; taller in background.)

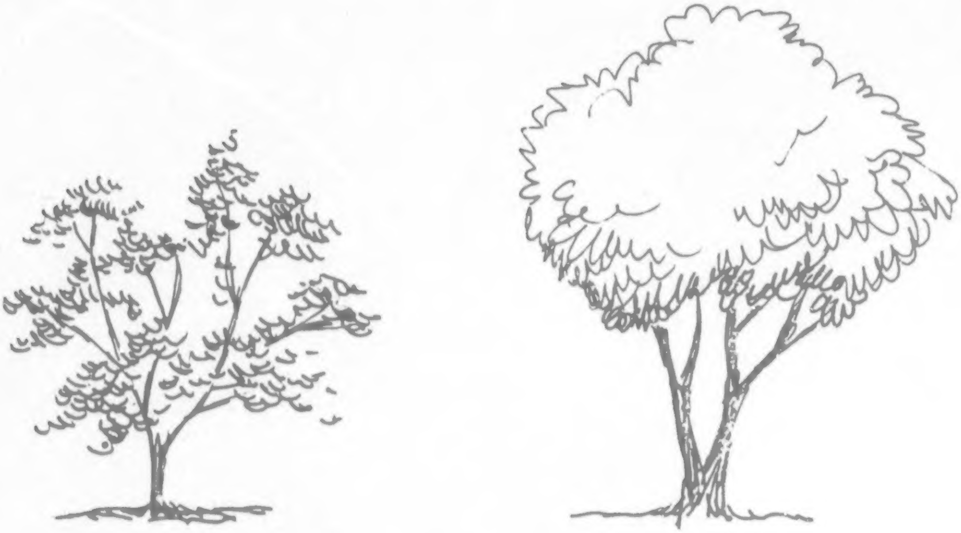
TM 2

HORTIII SE U1-9

# Examples of Contrast

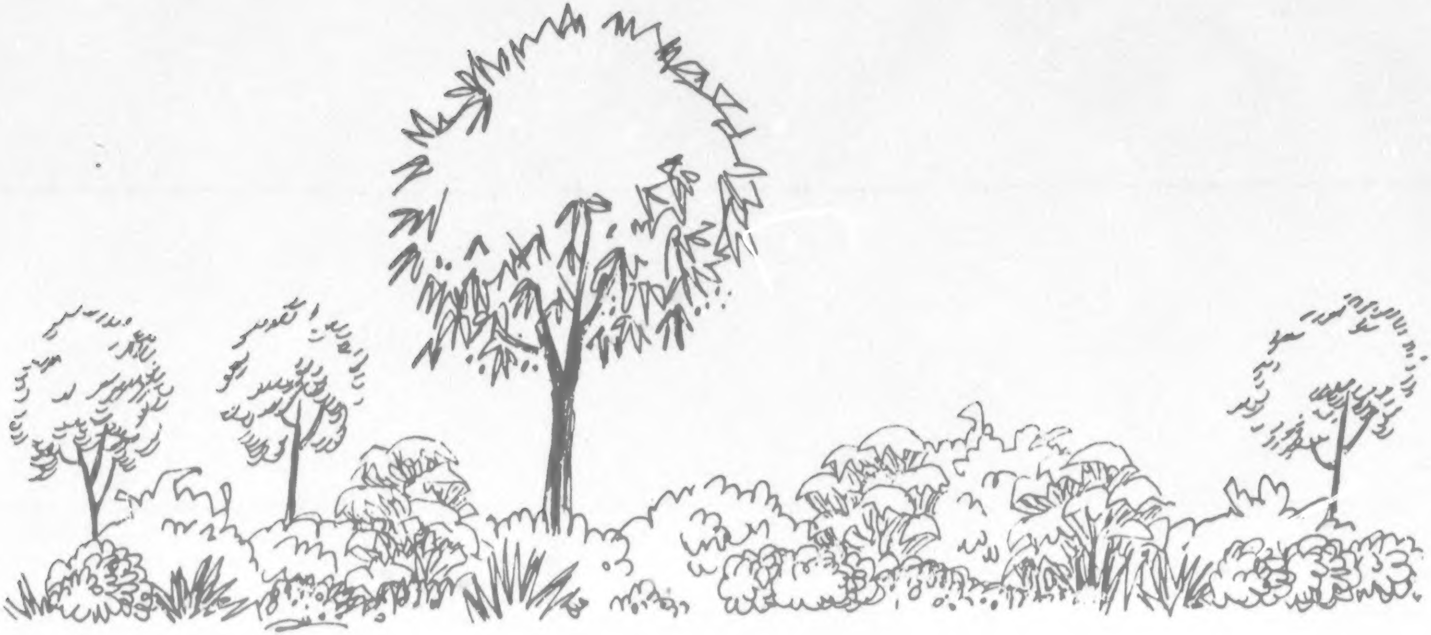


CONTRAST IN PLANT SHAPE.



CONTRAST OF THIN VS. DENSE TREE.

# An Example of Repetition

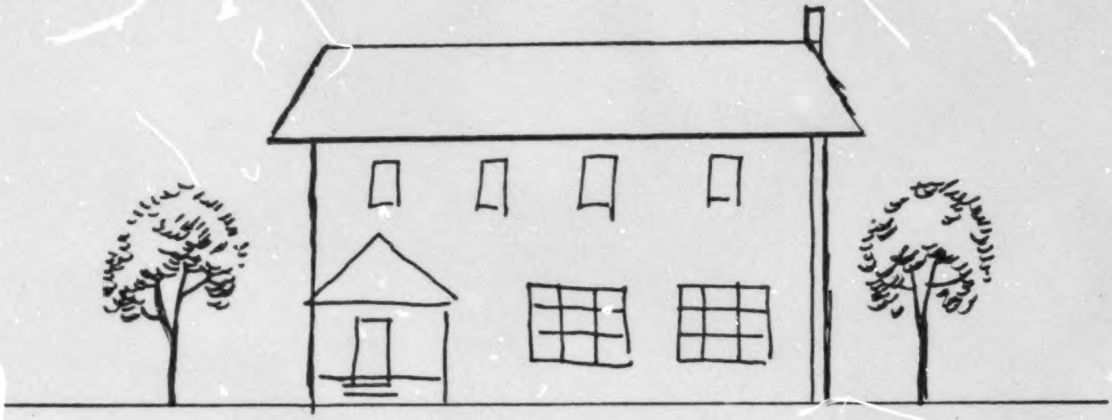


(Note: Reapparance of materials in several locations.)

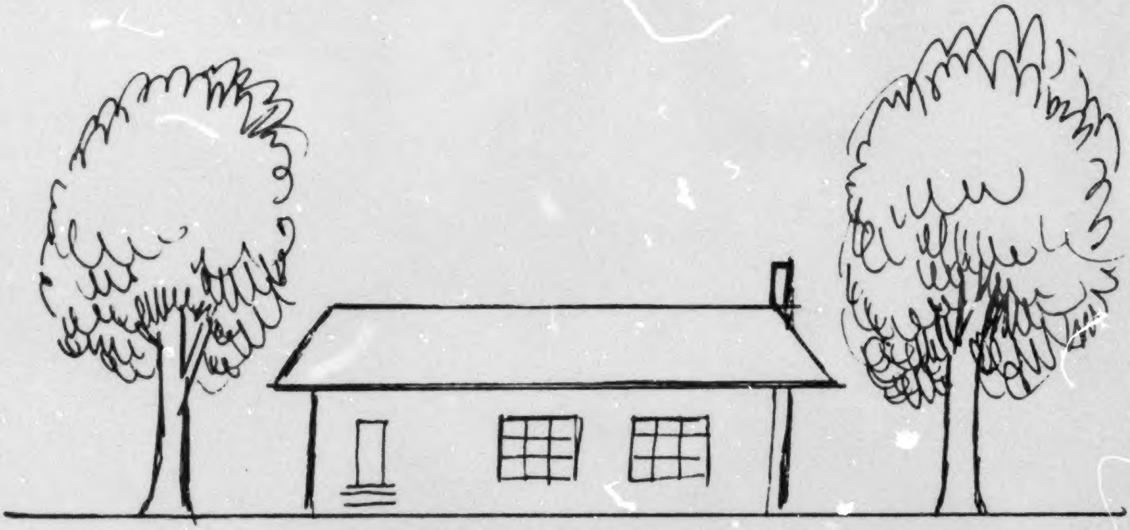
TM 4

HORTIII SE U1-11

# Proportion (Scale) in Landscape Design



(Note: Framing with small trees makes large house seem larger.)



(Note: Framing with large trees makes small house seem smaller.

TM 5

# LANDSCAPE NURSERY
## UNIT 1
## TEST

1. Match the following terms with the correct definitions:

_____a. Arborist

_____b. Asymmetrical

_____c. Focal Point

_____d. Landscape Design

_____e. Broadleaf Evergreen

_____f. Deciduous

_____g. Symmetrical

1. Plants which shed their foliage in the fall.

2. Center of interest.

3. Even number of plants on each side of a point.

4. Wide leaf foliage on the plant all year.

5. Uneven number of items on each side of a point.

6. One who takes care of trees.

7. The art of arranging and fitting together of lands and buildings for human use and enjoyment.

2. List five basic landscape design elements.

3. a. State three facts about symmetrical balance in landscape design.
   b. State three facts about asymmetrical balance in landscape design.

4. Select from the following statements those that pertain to sequence in landscape design.

_____a. Pertains to the use of plants on their ultivate size and rate of growth.

_____b. Low Shrubs act as "facing down" plants for tall shrubs.

_____c. Rate of growth has no bearing on arrangement of plants.

_____d. The care of plants does have a bearing on the rate of growth.

5. State four facts about contrast in landscape design.

6. List three methods of attaining contrast in landscape design.

## TEST

7. Identify as true or false the following statements concerning plant shapes in landscape design:

   _____a. A reappearance of the same plant form throughout the landscape setting is a method of repetition.

   _____b. Repetition never becomes monotonous.

   _____c. Plant effects are better achieved in single units rather than in groups of the same plant.

   _____d. Rhythm can be attained by varying and repeating shapes, colors, and textures in an appealing and inviting way.

8. State two facts about scale or proportion in landscape design.

9. List at least five items that should be on a new site checklist before making a landscape plan.

10. List at least five items that should be on an established site checklist before making a landscape plan.

11. Complete Assignment Sheet #1 to the satisfaction of the instructor.

# LANDSCAPE NURSERY

## UNIT 1

## ANSWERS TO TEST

1. a. 6 c. 2 e. 4 g. 3
   b. 5 d. 7 f. 1

2. Balance
   Sequence
   Contrast
   Repetition or Rhythm
   Proportion or Scale

3. a. This concept is visualized in viewing a formal garden.
      A landscape feature such as statuary or a fountain is used as a focal point.
      Arrangements of plants are the same on both sides of the focal point.
      Front entrance may be designed with both sides treated alike.
      Plant material and other landscape elements are arranged architecturally around this point.

   b. Asymmetrical balance gives direction to the planting, leading the eye to or away from a focal point.
      Units of mass, color, texture, and size are combined and varied to create a sense of balance.
      The sweeping and curving lines of an asymmetrical design should be in harmony with a natural setting and easy to maintain.
      Balance may be achieved by using informal groups of planting.
      An appealing asymmetrical design will have plants of varying masses of texture, sizes, and colors placed in an informal or natural manner not to the point of destroying unity, but enough so that it is interesting to view.

4. a, b, d

5. Contrast helps to break what otherwise might be considered monotonous.
   Too many contrasting shapes and forms will detract you from your point of interest.
   Contrast in plants should be gradual and subtle.
   Plant in groups of a kind rather than one of a kind.
   Contrast in plant colors should be few and far between.

6. Flowers, fall color, and fruit will offer contrast for part of the season.
   Foliage, twigs, and bark are better and more harmonious sources of contrast.
   Shades of green are better for contrast than using bright colors like reds or yellows.
   Contrast is attained by using plants of different sizes, colors, and with different foliage characteristics.
   Contrast can also be attained by using archiectural features, as well as boulders, rocks, or bark.

## ANSWERS TO TEST

7. a. True c. False
   b. False d. True

8. The art of keeping plants in proper scale to one another.
   Knowing the ultimate size of plants and the right plant for the right location.
   Using plants that can be kept pruned to scale in the planting.

9. Has top soil been applied, if so, to the proper depth?
   Are the slopes in the lawn too difficult to mow?
   Is the final grade completed?
   Has all the debris been removed?
   Are there any drainage problems?
   Is the existing material suitable for saving or should it be removed?
   Is the topography as asset or liability?

10. Is the lawn a complement to the property?
    Are the existing shade trees and flowering shrubs in good condition and in the correct location?
    Does the existing material need to be pruned or sheared?
    Do ony of the architectural features, such as walks, drives, or patios need to be changed or improved?
    Does the soil structure and pH present a problem for new planting?
    Will utility poles present a problem in new landscaping proposal?
    Is there an easement, if so, will it create a problem for landscaping?
    Has a soil test been taken?

11. Assignment Sheet #1 completed to the satisfaction of the instructor.

# LANDSCAPE NURSERY

## UNIT 2

## LANDSCAPE MAINTENANCE

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to define landscape maintenance terms; to describe the benefits of good landscaping; easier maintenance of a landscaped area, and being able to perform tasks pertaining to watering, pruning, fertilizing, cultivating, and spraying the plant material; prepare a maintenance schedule for one growing season to include the tasks to perform and man hours needed to do the job. This objective will be considered achieved upon attainment of a score of at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Match terms and definitons that pertain to landscape maintenance.
2. List five benefits of good landscaping for indoor and outdoor living.
3. Identify as true or false statements describing aids to easier maintenance of a landscape area.
4. List three facts about preparing the soil for easy maintenance.
5. State five environmental factors that affect proper maintenance.
6. List six of the basic needs that offect proper plant care.
7. Identify as true or false given statements that pertain to plant care.
8. Select from given statements those that pertain to methods of protecting plants.
9. Match terms and definitions that pertain to insects and disease.
10. List three facts for giving proper care of your tools.

# LANDSCAPE MAINTENANCE

## UNIT 2

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information and Assignment Sheets
3. Discuss Terminal and Specific Objectives
4. Discuss Information and Assignment Sheets
5. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Complete Assignment Sheets and turn in to instructor
4. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Assignment Sheets
    #1 - Importance of Well-Landscaped and Maintained Grounds
    #2 - Maintenance Schedule for your School or Home Grounds
4. Test
5. Answers to Test

References:

1. Sprague, Howard B., Turf Management Handbook, The Interstate Printers & Publishers Inc., Danville, Ill. 1970.
2. Sunset Landscaping, Sunset Books Ed. Lane Magazine & Book Co., Menlo Park, Calif. 1975.
3. Success with Trees & Shrubs, Scotts, Dept. C., Marysville, Ohio, 1978. Free

# LANDSCAPE MAINTENANCE
## UNIT 2
## INFORMATION SHEET

I. Terms and Definitions.

   A. Hardiness - plant zones - plants tolerance to temperature and climates.

   B. Nutrients - plant food.

   C. Mulch - any loose material, as straw or hay, placed about plant material to protect their roots.

   D. Landscape Maintenance - The preparation and care of plants in the landscape.

   E. Organic - Decomposed material that was once alive.

   F. Inorganic - Not derived from animal or vegetable life such as rock.

II. Benefits of Good Landscaping for Indoor or Outdoor Living.

   A. Well maintained and cared for home grounds will provide the following for the home owner.

      1. Attractiveness
      2. Comfort
      3. Convenience
      4. Usefulness
      5. Enjoyment

   (NOTE: These benefits are achieved by having a good landscape plan and provide proper care each year for the home grounds.)

III. Aids in Easier Maintenance of Landscape Areas.

   A. Understanding the environmental conditions of the area.

   B. Proper soil preparation.

   C. Understanding proper plant functions.

   D. Understanding proper pruning techniques.

   E. Understanding insect and disease control.

   F. Understanding weed control.

   G. Understanding how to protect a plant.

IV. Preparing Soil for Easy Maintenance.

   A. Soil test for pH and available nutrients.

      1. Too acid - add lime, gypsum, or a liming agent such as calcium or magnesium

         a. Change the soil structure.

## INFORMATION SHEET

   b. Improve the bacterial action.
   c. Hasten decomposition of organic materials.
   d. Plant foods become available rather than potential.

2. Lime is applied either as ground limestone or in a hydrate form.
   a. Hydrate form is more readily available.
   b. Do not apply over one ton per acre per application.
3. Too alkaline - add dusting sulphur, aluminum sulfate, copper or iron chelate.
   a. Phosphorus must be added at the same time when aluminum sulfate is used.
   b. Common powdered sulfur takes three to six months to produce results.

B. Have knowledge of soil structure.
   1. To improve fine-textured soil such as clay, use:
      a. Sand
      b. Humus, compost
      c. Peat moss - black or Canadian (red)
      d. Wood ashes (some)
      e. Decaying sawdust - wood shavings
         1. Use only from fast growing trees such as Cottonwood or sycamore
   2. To improve sandy soil texture add:
      a. Humus, compost
      b. Peat moss
      c. Wood ashes (some)
      e. Sawdust and wood shavings
         1. Only from soft wooded trees
         2. Be sure it is decayed

C. Have knowledge of types of fertilizers available.
   1. Commercial fertilizers are most economical to add plant nutrients to the soil.
   2. Urea from nitrogen is the safest to apply.
   3. Organic fertilizers add humus to the soil and the amount of nitrogen available is less than in the commercial form.
      a. Organic and urea form are non-burning and safe to use.

(NOTE: Understand how to read fertilizer labels for proper application.)

## INFORMATION SHEET

V. Environmental Factors that Affect Proper Maintenance.

A. Frost occurance. Frost free dates.

B. Seasonal rainfall distribution.

C. Humidity

1. Plants require more water in winter when humidity is low.

D. Duration and intensity of sunlight.

1. Some plants require shade or part shade locations due to high light intensity.

2. High intensity with high temperatures causes plants to burn

E. Soil characteristics

(NOTE: Select plants that are adapted for tour area for easy maintenance.)

VI. Basic Plant Needs that Affect Plant Care.

A. Light Requirements

1. Location of a shrub in sun, part in shade or sun.

B. Water requirements

1. Plants require more water when growing.

2. Methods of application

a. By hand - hose

b. Sprinklers - movable or underground sprinkler system.

c. Water deeper into the soil - Ross Root Feeder.

3. Overhead sprinkler applies approximately one inch of water an hour.

4. Inch of moisture a week is generally sufficient for plant growth

5. Water requirements vary with soil structure and temperature.

6. Plants require a thorough watering before the ground freezes in the fall.

C. Air requirements

1. Air currents are regulated by shape, size and location of plant materials.

2. Lack of air plus shade and moisture provides ideal conditions for disease and some insects to become active.

D. Nutrient requirements

1. Plants require a feeding for continued growth and improved hardiness.

2. Healthy plants have less maintenance problems.

3. Mulches provide some food as well as weed control and later becomes a soil conditioner.

## INFORMATION SHEET

E. Pruning requirements

  1. Regulated the shape and growth of a tree or shrub
  2. Large branches are cut twice with the second cut flush with the main stem and painted.
  3. Cross branching should be eliminated.
  4. Pruning a flowering shrub, remove oldest branches to the ground to allow new growth to start.
  5. Shrubs and evergreens should retain their natural growth appearance.
  6. Some plants such as spruce and pine cannot take severe pruning
  7. Plants do outgrow their situation and need to be replaced.

F. Cultivation requirements.

  1. Cultivation helps plants in three ways.
    a. Improves water retention in the root zone area
    b. Eliminates completition - weeds.
    c. Increases the growth of the plant.
  2. Plants with fine fiberous roots near the surface should not be cultivated, for example, Azaleas.

VII. Protecting the Plants - Winter and Summer.

  A. Amount of protection depends upon the natural hardiness of the plant and the severity of the climate.
  B. Mulching gives roots protection and aids in water retention.
  C. Extreme cold will take moisture from the plant with freezing of the twigs, branches and stems.
  D. Water in winter when ground is not frozen to supply more water for the plants.
  E. Summer winds and high temperatures take moisture from the plants and foliage will burn.
  F. Less hardy evergreens can be shielded from sun and wind damage by use of burlap screens.
  G. Less hardy plant material should be planted in protected locations
  H. Choose hardy plants that require minimum care.

VIII. Insects and Diseases to Look for - Controls.

  A. **Refer to HORTII SG Units I - V - Plant Problems and Controls.**
  B. Know when and what to look for and control.
    1. Bag worms
    2. Red spider

## INFORMATION SHEET

3. Scale
4. Leaf spot
5. Mildew

IX. Use and Care of Tools. (Refer to HortI SF - Horticulture Mechanics)

- A. Keep in good operating condition.
  1. Sharpen
  2. Keep from rusting - clean and oil
- B. Know proper use of each tool.
- C. Keep tools in an orderly fashion.

X. Grasses.

Refer to HortI SK U1 - Lawn Maintenance and HortIII SG U1 - Turf Management.

# LANDSCAPE MAINTENANCE

## UNIT 2

## ASSIGNMENT SHEET #1: Importance of Well-Landscaped and Maintained Grounds

I. Do the following:

   A. List the possible values relating the importance of a well-kept grounds.

   B. Write an expression of your values relating to well-landscaped grounds.

   C. Be prepared to lead a class discussion on the two specific tasks listed above.

# LANDSCAPE MAINTENANCE

## UNIT 2

## ASSIGNMENT SHEET #2: Maintenance Schedule for your School or Home Grounds

I. Prepare a work schedule for April through October of maintaining the trees, shrubs and evergreens, not the lawn area, showing work completed each month and approximate time spent to do each job. This would include pruning, spraying, fertilizing, watering, cultivating and mulching.

# LANDSCAPE MAINTENANCE

## UNIT 2

## TEST

1. Match terms:

______a. Hardiness
______b. Mulch
______c. Organic
______d. Nutrients
______e. Landscape maintenance

1. Loose material put at the base of plants to protect roots.
2. Decomposed material that was once alive.
3. Preparation and care of plants in the landscape.
4. Plants tolerance to temperature and climate.
5. Plant food.

2. List five benefits of good landscaping for indoor and outdoor living.

3. Identify as True or False the following statements describing aids to easier maintenance of a landscape area.

______a. Proper preparation of the soil.
______b. Plants may be pruned anytime of year without damage to plant.
______c. Understanding disease and insect control.
______d. Weeds are not a problem in the landscape.
______e. Winter protection of plants in our area is not necessary.
______f. All plants require some care.

4. List three facts about preparing the soil for easy maintenance of a landscape area.

5. Name four materials that are used for soil soil conditioning.

6. State five environmental factors that affect proper maintenance.

7. List six basic needs that affect proper plant care.

8. Identify as True or False the following statements that pertain to plant care.

______a. Trees and shrubs require the same kind of pruning.
______b. Some plants prefer a part shade to a full sun location.
______c. Plants require some moisture all year.
______d. Type of soil has no bearing on the amount of water applied.

## TEST

______e. Lack of air is one cause of disease on plants.

______f. Shade trees do not require to be fed once established.

______g. Time of the year does make a difference when a plant is pruned.

9. List three facts that cultivation does for a plant.

10. Select from the following statements those that pertain to methods of protecting plants.

______a. Thoroughly soaking the soil around plants before the ground freezes.

______b. A heavy mulch will keep the ground from freezing too deep.

______c. Water should not be applied during the winter months.

______d. High winds and summer temperatures take moisture from the plant.

______e. Evergreens and shrubs may be protected by use of a burlap screen.

______f. Winter cold does not remove moisture from twigs or branches of shade trees.

11. Matching of insects and disease.

______a. Bagworm

______b. Scale

______c. Mildew

______d. Red spider

______e. Leaf spot

1. Chewing insect feeding on outdoor plants primarily evergreens, in June, July and August.
2. Tiny spots on foliage that get larger and cuases leaves to drop.
3. Greyish coating on foliage, spring or fall of plants in shade or in need of air.
4. Tiny mite, sucking insect on indoor and outdoor plants.
5. Very small sucking insect that forms a hard shell for protection and found working on woody stems.

12. List three facts for giving proper care of your tools.

# LANDSCAPE MAINTENANCE

## UNIT 2

## ANSWERS TO TEST

1. a. 4 d. 5
   b. 1 e. 3
   c. 2

2. -Attractive
   -Comfortable
   -Convenience
   -Useful
   -Enjoyable

3. a. T d. F
   b. F e. F
   c. T f. T

4. a. Have a soil test made
   b. Have knowledge of soil structure
   c. Have knowledge of types of fertilizers available.

5. a. Peat moss d. Sand
   b. Compost e. Wood ashes
   c. Sawdust

6. a. Frost occurance d. Duration and intensity of light
   b. Seasonal rainfall e. Soil characteristics
   c. Humidity

7. a. Light d. Air
   b. Water e. Cultivation
   c. Nutrient f. Pruning

8. a. F e. T
   b. T f. F
   c. T g. T
   d. F

9. a. Eliminates weeds
   b. Helps in water retention
   c. Aids in plant growth

## ANSWERS TO TEST

10. a,b,d,e

11. a. 1
    b. 5
    c. 3
    d. 4
    e. 2

12. a. Cleaning
    b. Sharpening
    c. Oiling
    d. Proper place for each tool

# LANDSCAPE NURSERY

## UNIT 3

## HANDLING AND PLANTING NURSERY PLANTS

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to identify the proper methods of handling, planting, and maintaining nursery plants. They will also be able to list terms, principles, and practices necessary for successful transplanting of nursery stock. This objective will be considered achieved upon attainment of a score of at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. List the best season in Kansas for planting and for pruning the various types of ornamental trees and shrubs.
2. Choose from given statements those that are correct concerning the handling, planting, and maintenance of ornamental trees and shrubs.

## NURSERY LANDSCAPE

## UNIT 3

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information Sheets
3. Make transparencies
4. Discuss Terminal and Specific Objectives
5. Discuss Information Sheets
6. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Take Test

## INSTRUCTIONAL MATERIALS

Included in the unit:

1. Objectives
2. Information Sheets
3. Transparency Masters
    - #1 - Ball and Burlap
    - #2 - Staking Trees
    - #3 - Tree care
    - #4 - Transplanting
    - #5 - Guying and Protecting
4. Test
5. Answers to Test

References:

1. "Nursery Production" The Pennsylvania State University, College of Agriculture, Agricultural Experiment Station, Department of Agricultural Education, University Park, Pennsylvania. Teacher Education Series, Volume 12, Number 4t, 1971.
2. Hartman, H.T., and Kester, D.E., Plant Propagation: Principles and Practices, Prentice-Hall, Inc., Englewood Cliffs, New Jersey 07632, 1974.
3. Denisen, Ervin L., Principles of Horticulture. The Macmillan Company, New York, New York.
4. Bairnigardt, John P., How to Prune Almost Anything, Morrow & Co., Inc., 1968.

# NURSERY LANDSCAPE

## UNIT 3

## INFORMATION SHEET

I. Time of Planting

A. Under Kansas conditions, early spring is the best time to plant bare-root trees and shrubs.

B. Balled and burlapped or container-grown stock may be planted at any time of the year, as long as soil moisture and wind protection is provided.

C. As a general rule, deciduous trees and shrubs are best planted while dormant.

D. Evergreen plants can be planted any season, as long as care is taken to maintain a soil ball around their roots.

II. Size of Transplanting Hole

A. Dig the hole at least one foot deeper and two feet wider than required for the ball or spread of the roots. In very tight soils, dig a post hole down from the center of the hole and fill it with coarse sand or fine gravel. This drainage channel will help excess water to escape from the root zone.

B. Heavy soils and sandy soils will both benefit from the addition of peat or humus.

III. Planting

A. Plant the nursery stock as soon as it is received from the nursery.

B. The roots or soil ball should be kept covered with a damp cloth.

C. Bare-root shrubs and trees are best placed in a bucket of luke-warm water for 15-30 minutes prior to planting.

D. Before planting bare-root material, the roots should be pruned-back slightly to stimulate new development of fibrous roots.

E. Usually, one-third of the top growth of most deciduous shrubs, planted bare-root, should be removed before planting to compensate for roots that are damaged or have been removed .

F. The practice of pruning roots and top is not necessary for shrubs purchased in containers or balled-and-burlapped unless roots appear to circle the perimeter and girdle each other.

G. Place a mound of soil in the bottom of the hole so that the roots of the bare-root plant can be spread to a natural position over it.

## INFORMATION SHEET

H. Set the plant at the same depth as it grew in the nursery.

I. When the planting hole is nearly filled with topsoil, thoroughly settle the soil with water.

IV. Staking and Guying

A. Trees more than four inches in diameter need to be supported with guy wires.

B. Attach three guy wires to the tree, running each wire through a piece of hose before encircling the trunk at a crotch.

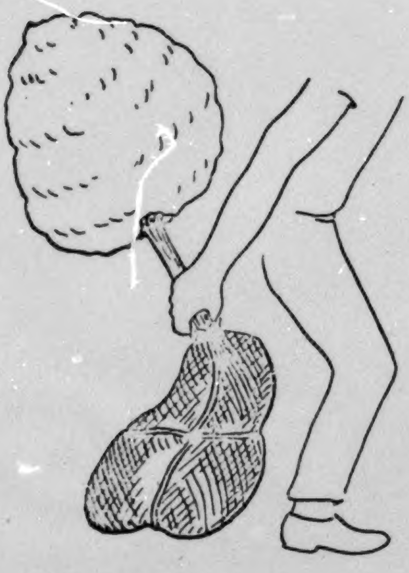
C. Anchor stakes should be placed in the ground at a distance from the trunk equal to the height at the crotch.

V. Additional Care at Planting Time

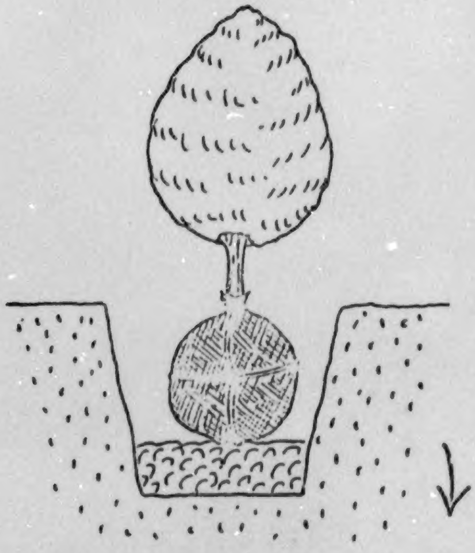
A. A three foot diameter circle should be cleared of grass around the trunk of a tree at planting time. This strip, for water, should be 2-3 inches deep and may be left to bare soil or filled with a mulch material.

B. As a further precaution for the first 3-4 years, use a tree trunk wrap to protect young trees from sun scald during the winter months. This is especially important with smooth-barked trees, such as hard maples, oaks, sweetgum and thornless honeylocusts.

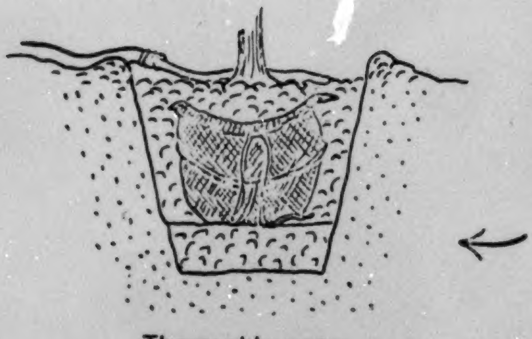
# Ball and Burlap



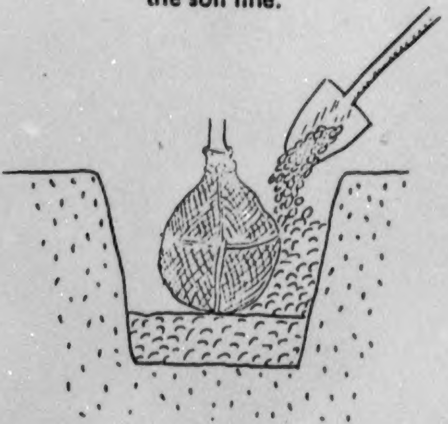
Don't carry this way.



The top of the ball
should be set at
the soil line.



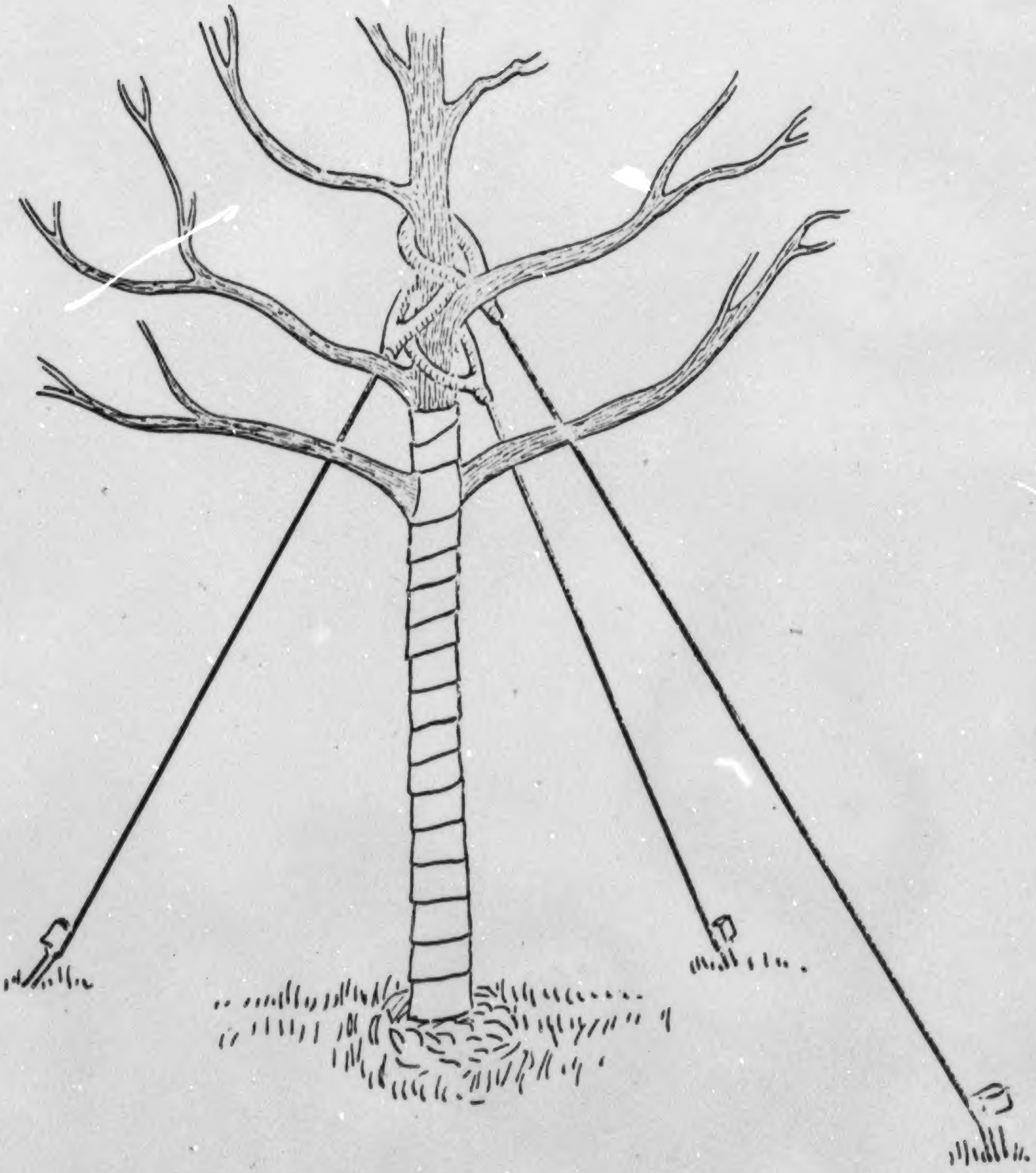
Thoroughly water.



Firm soil around ball.

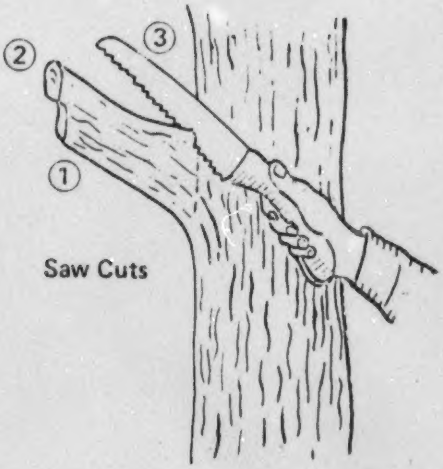
The ball and burlap method is used for transplanting many evergreens and some large deciduous trees. The root system can be protected from the wind and dry air by the protective burlap covering which soon disintegrates after planting. The soil should be carefully prepared prior to planting and a hole dug twice the width and a little deeper than the ball. A soil amendment (peat moss) may be added at this time to improve the soil structure. Set the ball in the center of the hole and carefully firm soil to avoid air pockets. Loosen the strings at the top of the ball, fill the hole, and water throughly several times.

# Staking Trees

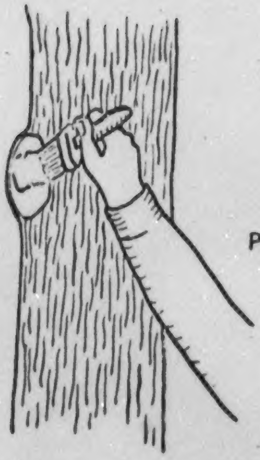


Small diameter trees (less than 2") can be supported with a single stake (2"x2"x8'). Slip a piece of wire through a section of an old hose and tie the tree to the stake. Slightly larger trees will require two stakes each of which must be set some eighteen inches into the ground. Trees over four inches will require support from three guy wires. Wrap trunks of newly planted trees with a special tree wrap (crepe paper) or burlap.

# Tree Care

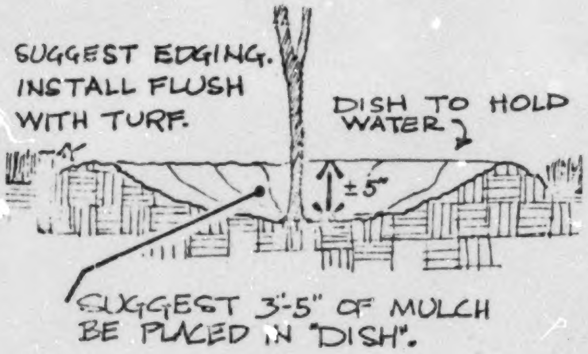


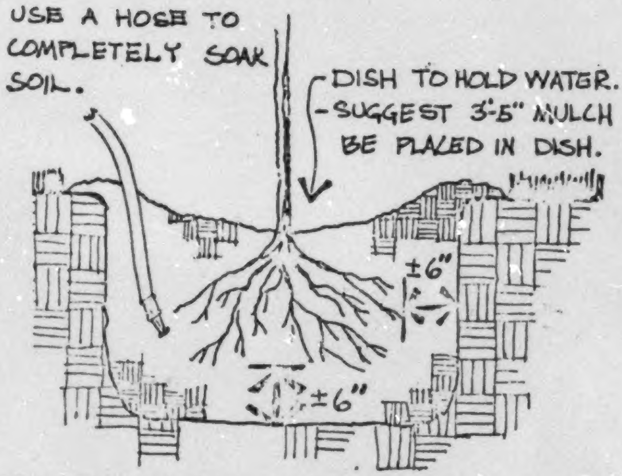
Saw Cuts

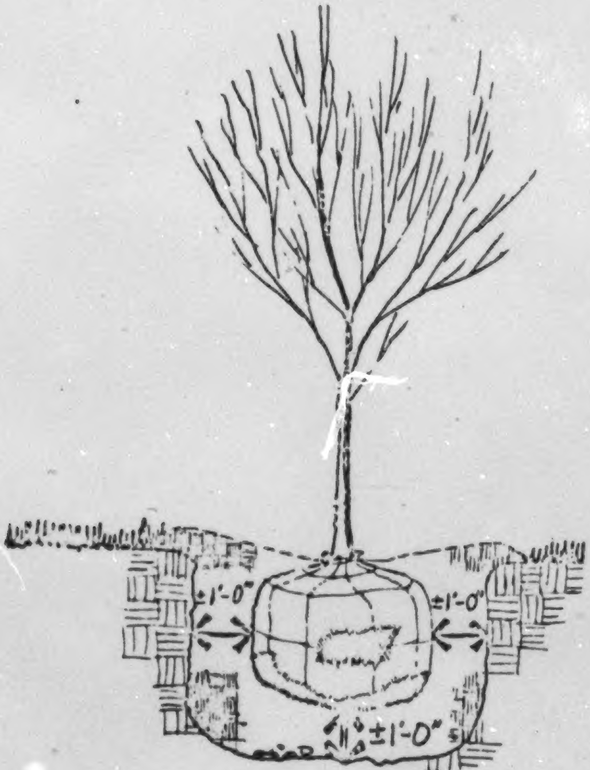


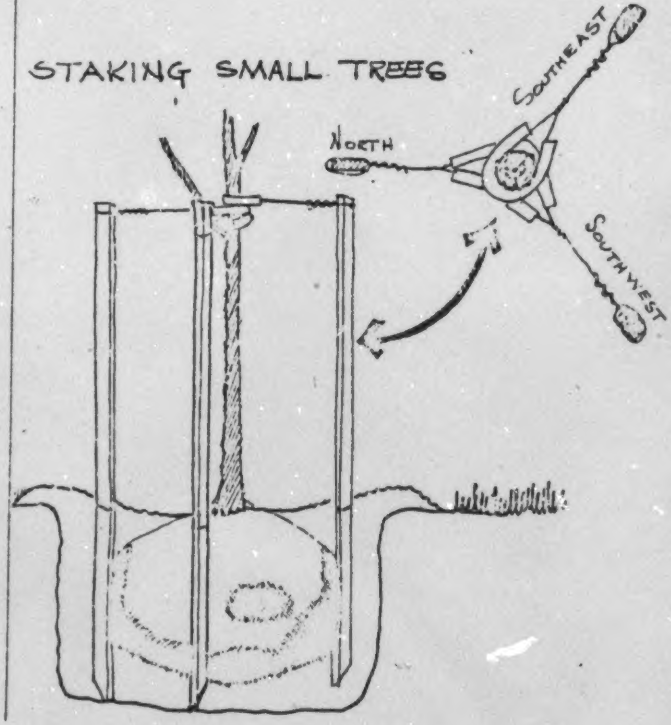
Painting Wounds

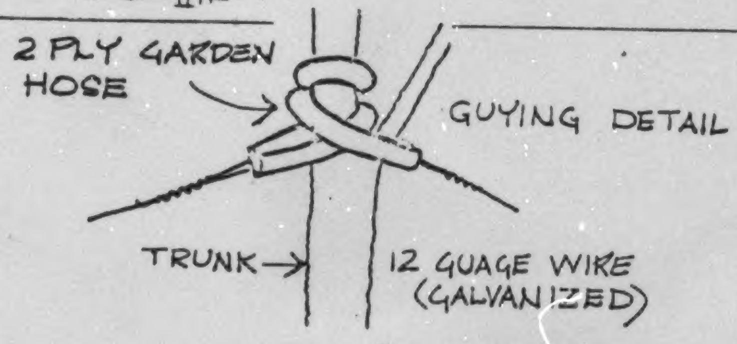
To prevent stripping the bark, make a saw cut at 1 and then a second cut at 2 when removing a limb. A third cut at 3 is required to avoid leaving a stub. Failure to remove a stub may provide entry points for disease organisms. Tree wounds should be painted (asphalt or tree paints) after removing loose or injured bark. Shape the cut (30-45°) so it slopes in a downward direction. A shallower angle permits water to soak into the wood.

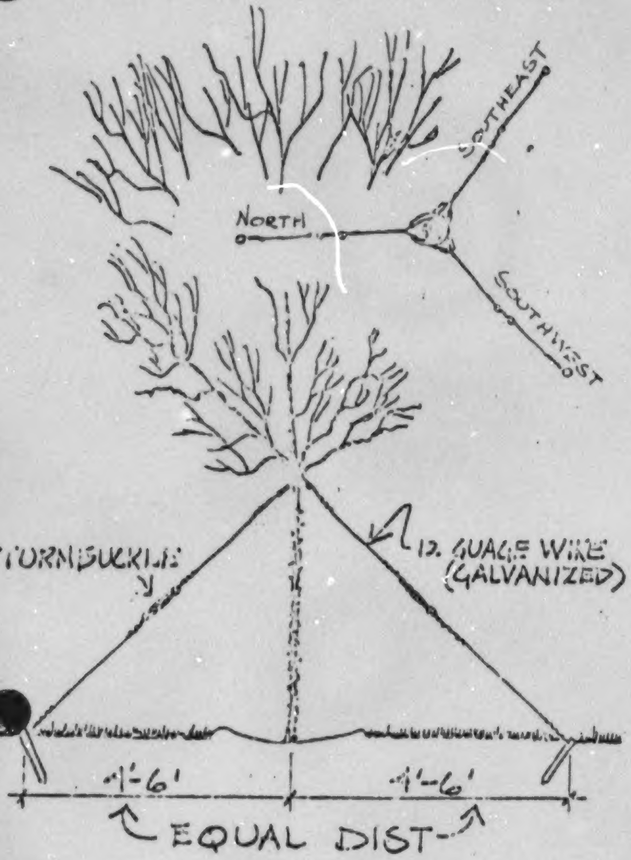

SUGGEST EDGING. INSTALL FLUSH WITH TURF.
DISH TO HOLD WATER
±5"
SUGGEST 3"-5" OF MULCH BE PLACED IN "DISH".


USE A HOSE TO COMPLETELY SOAK SOIL.
DISH TO HOLD WATER.
-SUGGEST 3"-5" MULCH BE PLACED IN DISH.
±6"
±6"

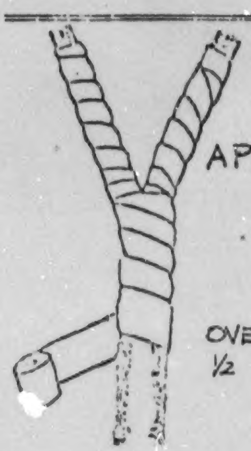

±1'-0"
±1'-0"
±1'-0"


STAKING SMALL TREES
NORTH
SOUTHEAST
SOUTHWEST


2 PLY GARDEN HOSE
GUYING DETAIL
TRUNK
12 GUAGE WIRE (GALVANIZED)


NORTH
SOUTHEAST
SOUTHWEST
TURNBUCKLE
12 GUAGE WIRE (GALVANIZED)
4'-6'
4'-6'
EQUAL DIST

GUYING LARGER TREES



APPLYING TREE WRAP

OVERLAP WRAP ½ OF ITS WIDTH.

# NURSERY LANDSCAPE

## UNIT 3

## TEST

1. In Kansas which is considered the best for planting bare-root trees and shrubs?

2. A. What is the purpose of the tree trunk wrap on young trees?

   B. Why should the roots of bare-root material be pruned-back slightly before planting?

   C. (Complete the following statement)

   Trees more than ________________ in diameter need to be supported with guy wires.

   D. Give the size of the transplant hole as compared to the root ball or the spread of the roots.

   E. Identify as true or false the following statements concerning the handling, planting, and maintaining of nursery plants.

____1. Evergreen plants should only be planted in the fall.

____2. Bare-root shrubs and trees are best placed in a bucket of luke-warm water for 15030 days prior to planting.

____3. When staking and guying trees the anchor stakes should be placed in the ground at a distance from the trunk equal to the height of the tree.

____4. When transplanting a tree, set the plant at the same depth as it grew in the nursery.

____5. Hackberry is one of the smooth-barked trees which is especially subject to sun scald.

____6. As a general rule, deciduous trees and shrubs are best transplanted while they are growing vigorously.

____7. Heavy, clay soils and sandy soils will both benefit from the addition of peat or humus.

# NURSERY LANDSCAPE

## UNIT 3

## ANSWERS TO TEST

1. In Kansas the best season for planting bare-root trees and shrubs is in early spring.

2. A. The purpose of the tree wrap is to protect the trunk from sun scald during the winter months.

   B. The purpose of slightly pruning the roots of bare-root plants before planting is to stimulate new development of fibrous roots.

   C. Four (4) inches.

   D. The transplant hole should be dug at least one foot deeper and two feet wider than the size of the root ball or the spread of the roots.

   E. 1. (F)
      2. (F)
      3. (F)
      4. (T)
      5. (F)
      6. (F)
      7. (T)

# LANDSCAPE NURSERY

## UNIT 4

## TREE MAINTENANCE

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to define the terms associated with tree maintenance and to list objectives, principles, and developmental methods relating to tree maintenance. This objective will be considered achieved by scoring at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Match tree maintenance terms with their definitions.
2. List the characteristic forms of trees.
3. Identify as true or false statements about tree pruming.
4. Identify when tree wounds need treating.
5. Write a short discussion concerning the selection of scaffold branches.
6. Describe the function of temporary branches in the formation of a sturdy trunk.
7. Describe the method of transplanting container grown trees.
8. Describe the proper pruning methods on deciduous trees.
9. Describe the proper pruning methods on evergreen trees.
10. Describe the proper pruning methods on vines.
11. Describe the proper pruning methods on hedges.

# TREE MAINTENANCE

## UNIT 4

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information Sheets
3. Make transparencies
4. Discuss Terminal and Specific Objectives
5. Discuss Information Sheets
6. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Transparency Masters

TM 1 - Pruning Tools
TM 2 - Tree Forms
TM 3 - Pruning Methods
TM 4 - Incorrect and Correct Pruning Methods
TM 5 - Tree Care
TM 6 - Leader
TM 7 - Pruning Evergreen
TM 8 - Pruning Formal Hedges
TM 9 - Thinning and Pruning Hedges
TM 10- Pruning Deciduous Shrubs
TM 11- Pruning - Thinning
TM 12- Pruning
TM 13- Rejuvenation

## SUGGESTED ACTIVITIES

4. Test

5. Answers to Test

References:

1. van Der Hoeven, Gustaaf, "All About Pruning", C-550. Cooperative Extension Service, Kansas State University, Manhattan, Kansas. 1977.

2. Denisen, Ervin L., Principles of Horticulture, The Macmillan Company, New York, N.Y. 1974.

3. Nelson, Wm. R. Jr., Landscaping Your Home, Circular 858, University of Illinois, College of Agriculture, Cooperative Extension Service, Urbana, Illinois. 1971.

# TREE MAINTENANCE

## UNIT 4

## INFORMATION SHEET

I. Terms and Definitions.

A. Annual Rings - Growth rings visible in cross-section of wood plant stems.

B. Apical - The point or tip of a stem or branch.

C. Auxin - Natural hormone produced in apical regions. It inhibits growth of lateral buds.

D. Auxillary - In the angle formed by the leaf and stem.

E. Branch - A subsidiary stem arising from the main stem or another branch.

F. Callus - Wound tissue which develops from cambium or other exposed meristem.

G. Cambium - The cylinder of meristematic tissue between the wood (xylem) and bark (phloem).

H. Dormant Period - Time during which no growth occurs because of unfavorable environment.

I. Evergreen - Retains functional leaves throughout the year.

J. Foliage - The leaves of a plant.

K. Girdling - Destroying an area of phloem (bark) around the periphery of a stem resulting in death of the plant.

L. Graftage - Method of inserting buds, twigs, or shoots on other stems or roots for fusion of tissues.

M. Heartwood - Central cylinder of xylem tissue in a woody stem.

N. Latent Bud - An inactive bud not held back by rest or dormant period but which may start growth if stimulated.

O. Leader - That portion of the trunk extending from the first (lowest) scaffold branch upward.

P. Meristematic - Capable of cell division.

Q. Node - Structure on a stem from which leaves arise.

R. Phloem - A complex tissue of sieve tubes and parenchyma. Responsible for the translocation of food in solution. The inner bark of woody plants.

S. Pinching Back - Pruning the soft succulent tip of a shoot to stimulate lateral growth.

T. Pruning - The methodical (judicious) removal of parts of a plant with the object to improve its form and to improve growth and production.

U. Rest Period (resting bud) - Period of non-visible growth. Controlled by internal factors.

## INFORMATION SHEET

V. Sapwood - Outer portion of xylem tissue and the area of upward movement of water and nutrients in a woody stem.

W. Scaffold Branches - The primary branches of a tree arising from the trunk or leader.

X. Secondary Branches - The branches of a tree arising from the scaffold branches.

Y. Subordination - Severe heading back of all but one of multiple leaders to restore apical dominance.

Z. Sucker - Shoot arising from a root.

AA. Terminal - The distal end as of a shoot, twig, or branch.

BB. Thinning out - Pruning off entire stems or branches to give remaining stems or branches more space and more reserve food.

CC. Training - Shaping or adapting plants to specific forms by pruning, tying, or bracing.

DD. Tree Surgery - A pruning art involving removal of large limbs, cleaning and treating wound, and bracing weak trunks and crotches.

EE. Twig - one-year-old branch or stem of a woody plant.

FF. Watersprouts - Rapid growing shoots that arise from adventitious or latent buds on branches or trunks.

GG. Woody - Hard, tough, and fibrous. Non-herbaceous.

HH. Xylem - A complex tissue or tough, fiberous, elongated cells forming vessels and woody tissue. Responsible for upward movement of water and minerals from roots to leaves.

II. Heading Back - Pruning off the terminal portion of a twig or branch back to a bud or side twig.

JJ. Trunk - The main stem of a tree from the root junction up to the first scaffold branch.

II. Tree Form.

A. When pruning, you must know the characteristic form of the tree before any live branches are cut out. Little or no attempt should be made to change the characteristic habits of growth, which are common to every species.

B. Seven different tree forms.

1. Irregular
2. Vase
3. Columnar
4. Round
5. Weeping
6. Oval
7. Pyramid

INFORMATION SHEET

C. Tree species naturally strong in structure and regular in shape and form will need a minimum of limb removal other than cutting out dead material (e.g., pin oak, sweet gum).

D. Trees with diffuse branching habits will need more attention the first 15 years of their lives and especially the first 5 years to establish a strong crown structure capable of supporting the heavier and more rambling types of crown which will develop as the tree grows older (e.g., hackberry, elm, silver maple).

E. A true central leader tree should be restricted to one trunk. The central growing point is kept dominant by heading back any side branches which appear to compete with it. The result of this type of growth is a relatively tall, very strong tree. On trees with a modified leader, such as maple or linden, the terminal may be thinned back lightly to a lateral (sidebranch) which then becomes the new leader.

## III. When to Prune

A. The ideal time to prune most trees is during the dormant season before new growth starts.

B. Spring flowering trees bloom on last year's wood. If maximum flowering is to be enjoyed, prune after trees have bloomed.

C. Summer flowering trees bloom on this year's wood. To have maximum flower display, prune in early spring or during winter.

## IV. Treating Wounds

A. Tree wounds less than an inch in diameter usually heal over rapidly. All pruning wounds more than 1½ inch in diameter should be treated with tree wound dressing.

B. For treating tree wounds use asphaltum paints or asphaltum water emulsion, which is a paste.

## V. Selection of Scaffold Branches

A. The major scaffold branches should be spaced at least 8 inches vertically apart, but better is 18 to 25 inches.

B. Encourage radial branch development.

C. Select scaffold or lateral branches that grow at a wide angle to the trunk. These branches will be stronger as they have more connective wood at the top than a narrow angled crotch.

## VI. Formation of a Sturdy Trunk

A. Temporary branches on the lower part of the trunk will strengthen the trunk and give protection.

B. The trunk will increase more rapidly in base diameter as the leaves and growing points on these branches provide food and hormones for more rapid trunk growth.

C. Temporary branches shade the trunk and reduce the likelihood of sunburn injury to the bark and cambium, particularly on the southwest side of the trunk.

D. This low growth acts also as a guard and helps protect the trunk from possible injury caused by mowers, cars, animals, etc.

E. Leaving temporary branches along the trunk and allowing the tree trunk to flex in the wind not only will increase the trunk diameter near the base, but will also increase the trunk taper. A well tapered trunk permits a more uniform distribution of stress, reducing the danger of a broken trunk when exposed to strong winds.

VII. Container Grown Trees.

A. At time of transplanting, remove the container from container grown plants and check the root growth.

B. Prune off broken and damaged roots and prune approximately a third of length of twigs and small branches to compensate for loss of roots.

C. If roots have grown in a circular pattern or if the roots cross each other, spread them out or prune them back.

VIII. How to Prune.

A. The principle behind pruning small twigs is always to cut back to a bud which is directed outward and will produce new growth.

B. Make slanted cuts back to healthy wood. The proper pruning cut should be about ¼ of an inch above the bud, slanted away from it.

C. Larger branches which are too heavy to be held require three separate cuts to prevent bark stripping. (See TM 4).

D. Cuts made too close to the trunk will leave unnecessarily large wounds - neither should stubs be left.

IX. Pruning Evergreen Trees.

A. Needleleaf Trees.

1. This group of evergreen includes pine, spruce, hemlock, and fir. These tall growing evergreen, called conifers, normally grow into broad pyramid shaped trees with a center leader.

2. Conifers should have only one central leader. A developing second leader should be pruned out while the tree is small.

3. By pruning the candle-like terminal growth back half to two thirds, the height and width of pine trees can be controlled and a more dense growth encouraged.

B. Junipers

1. The group of junipers includes pyramidal, upright, spreading and creeping types. During early spring prune dominant branches back to a side branch.

## INFORMATION SHEET

C. Arborvitae

1. Arborvitae can be pruned like the juniper. Here, one should be careful not to prune into the dead center.

D. Broadleaf Evergreens

1. If pruning is needed on broadleaf evergreens, do so in early spring by thinning out. Those that flower should be pruned after flowering.

X. Vines and Ground Covers.

A. Vines

1. The prupose for pruning vines is to remove dead wood, thin branches and limit growth as well as to promote new growth and improve flowering.

B. Ground Covers

1. Ground covers may need pruning to keep them retained, to remove dead or old growth, or to rejuvenate the planting.

XI. Pruning Deciduous Hedges.

A. There are two types of hedges, the informal and the formal.

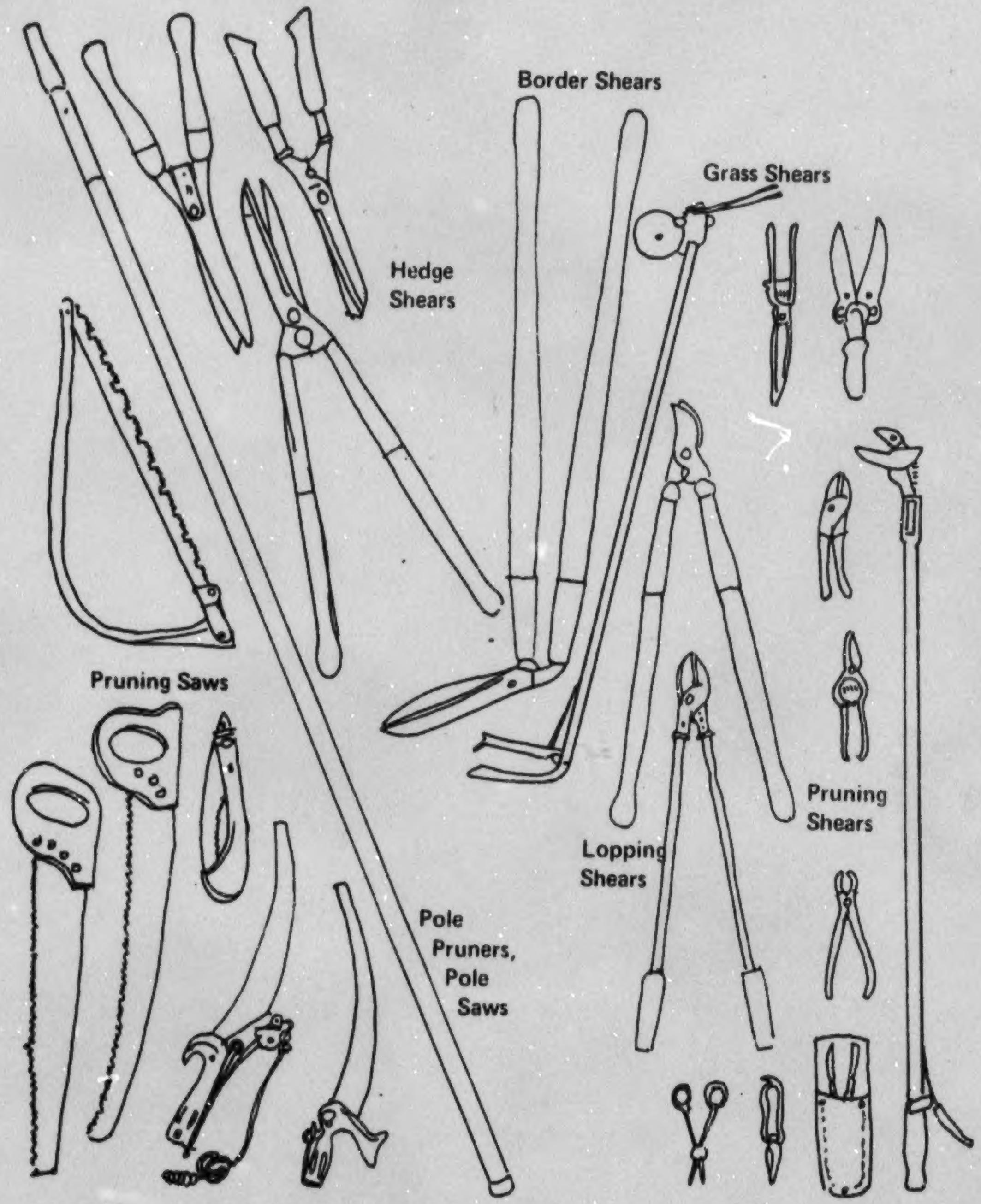
1. The informal hedge is generally formed by a row of shrubs planted close together, but the shrubs are allowed to grow normally.

2. The formal hedge is pruned or sheared to a definite size and shape one or more times each growing season.

B. It is extremely important to prune a newly planted hedge immediately to encourage ample shoot development close to the ground so that the plants will grow into dense bushy shrubs out of which good hedges can be made.

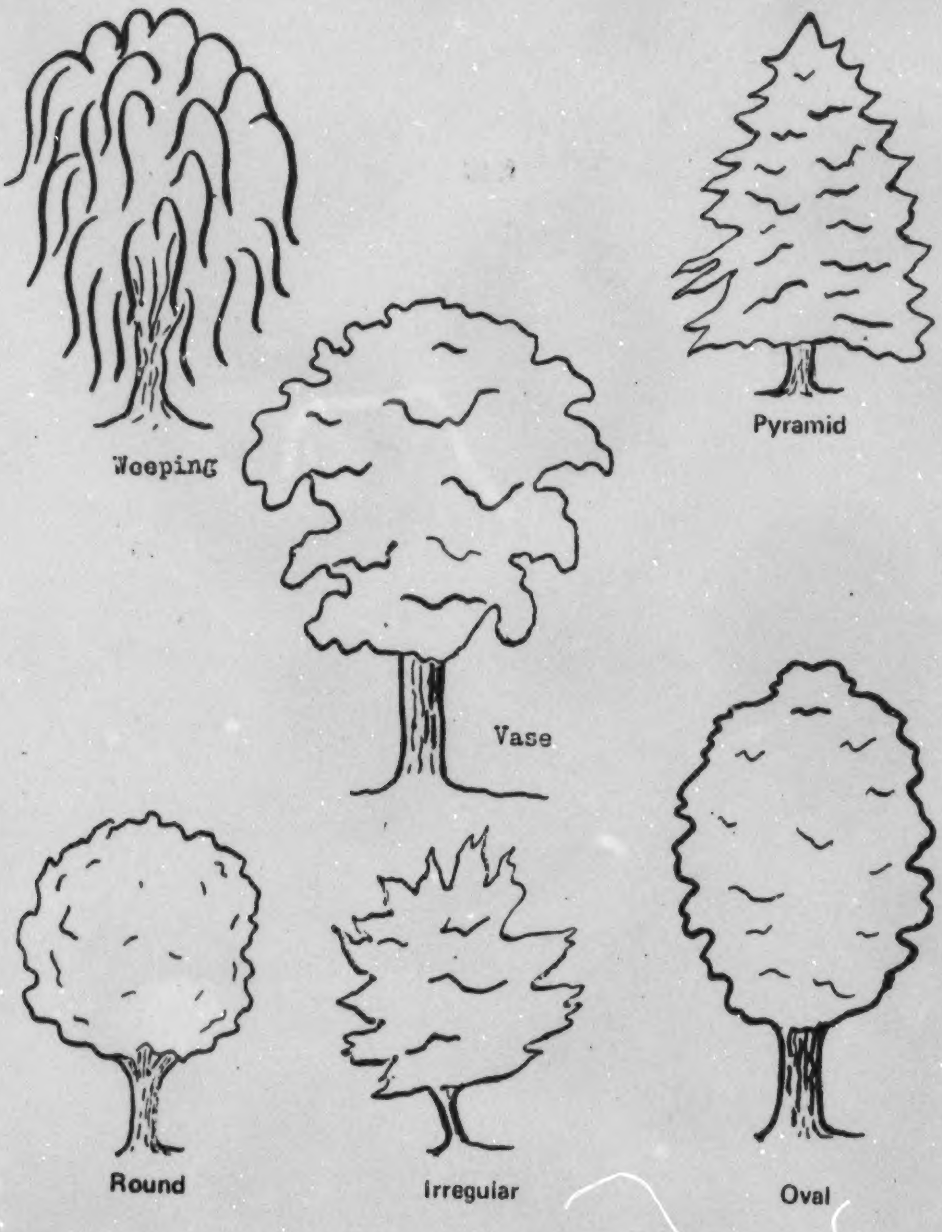
C. The shape of a formal hedge should be a narrow pyramid. The top of the hedge should be narrower than the base.

# Pruning Tools

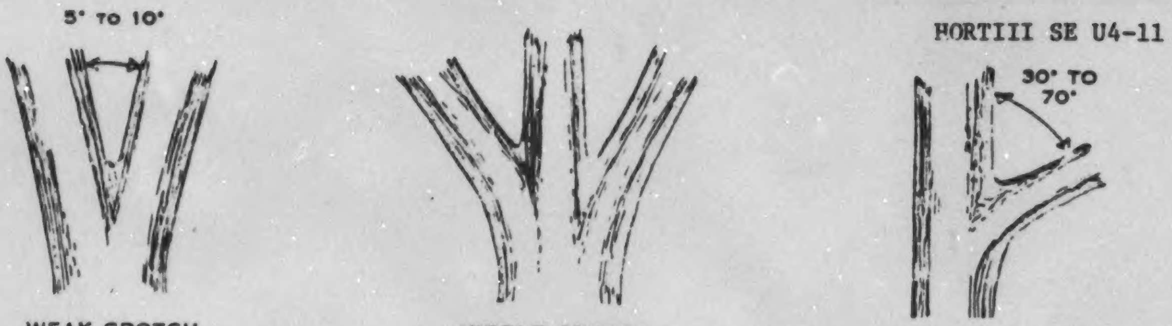

Border Shears
Grass Shears
Hedge Shears
Pruning Saws
Pruning Shears
Lopping Shears
Pole Pruners, Pole Saws

TM 1

# Tree Forms



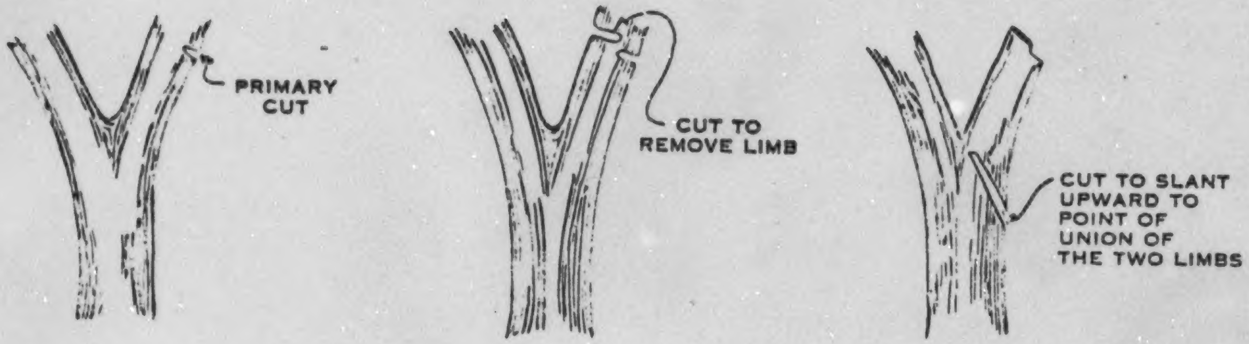
Each tree has a great deal of character to offer the home owner. Consider the profile of a particular specimen in addition to the color of its foliage and other important plant characteristics. While the round, oval and irregular forms may predominate in a landscape plan, one may wish to incorporate one of the other shapes to add special interest to a particular setting.


5° TO 10°
30° TO 70°

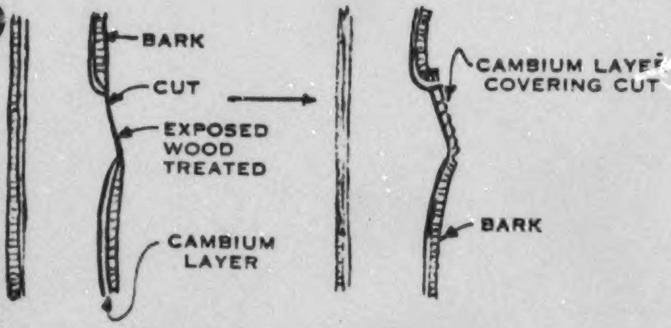
WEAK CROTCH TOO NARROW

MIDDLE CROTCH CROWDED

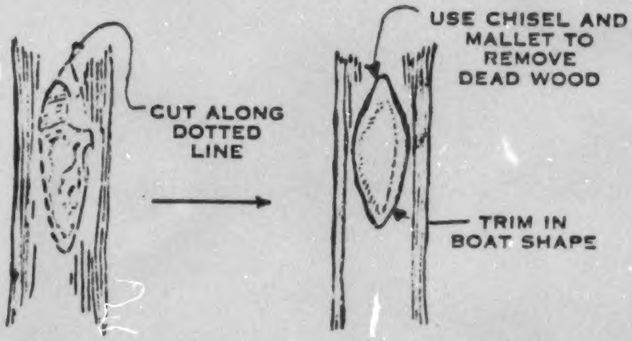
EXCELLENT ANGLE


PRIMARY CUT
CUT TO REMOVE LIMB
CUT TO SLANT UPWARD TO POINT OF UNION OF THE TWO LIMBS

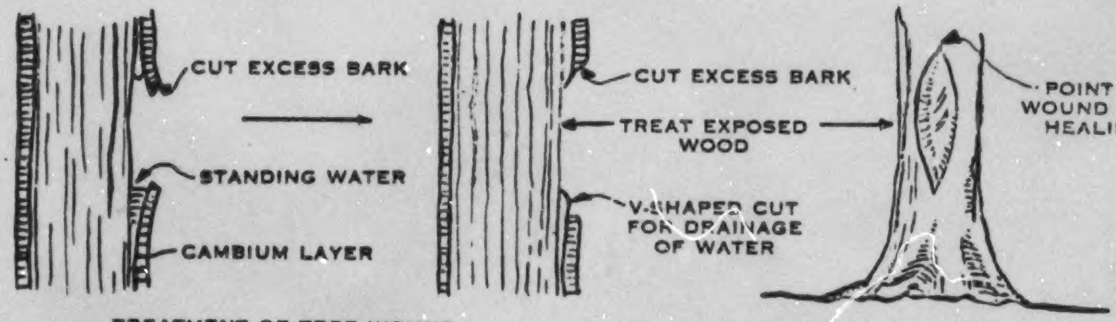
PROPER PROCEDURE IN PRUNING FOR CROTCH


BARK
CUT
EXPOSED WOOD TREATED
CAMBIUM LAYER
CAMBIUM LAYER COVERING CUT
BARK

HEALING PROCESS OF CUT

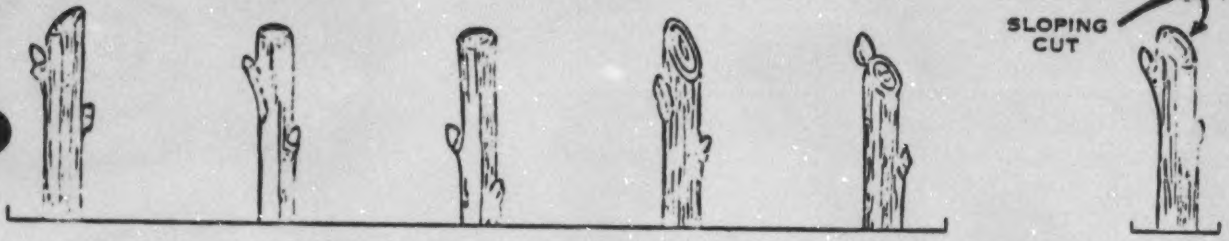

CUT ALONG DOTTED LINE
USE CHISEL AND MALLET TO REMOVE DEAD WOOD
TRIM IN BOAT SHAPE

TREATMENT OF TREE WOUND


CUT EXCESS BARK
STANDING WATER
CAMBIUM LAYER
CUT EXCESS BARK
TREAT EXPOSED WOOD
V-SHAPED CUT FOR DRAINAGE OF WATER
POINT IN WOUND AIDS HEALING

TREATMENT OF TREE WOUND

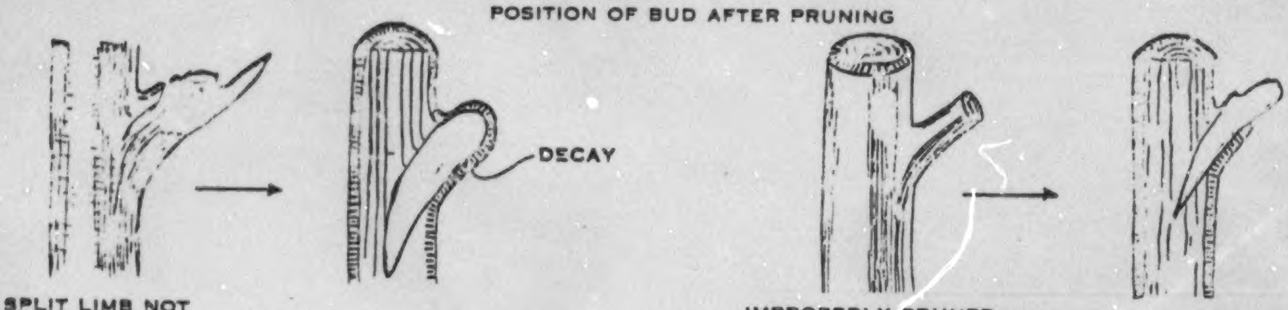
Pruning methods.


SLOPING CUT

INCORRECT METHODS

CORRECT METHOD

POSITION OF BUD AFTER PRUNING

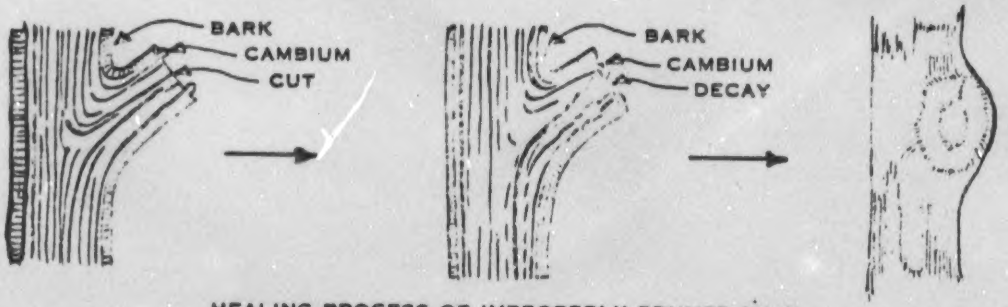


SPLIT LIMB NOT PRUNED

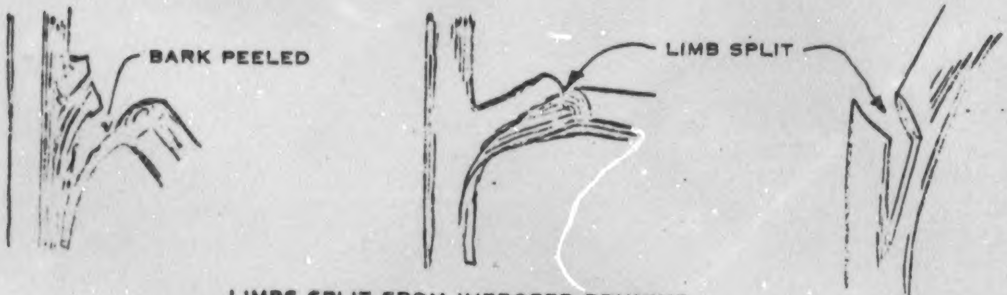
RESULTS IN DECAY

IMPROPERLY PRUNED LIMB

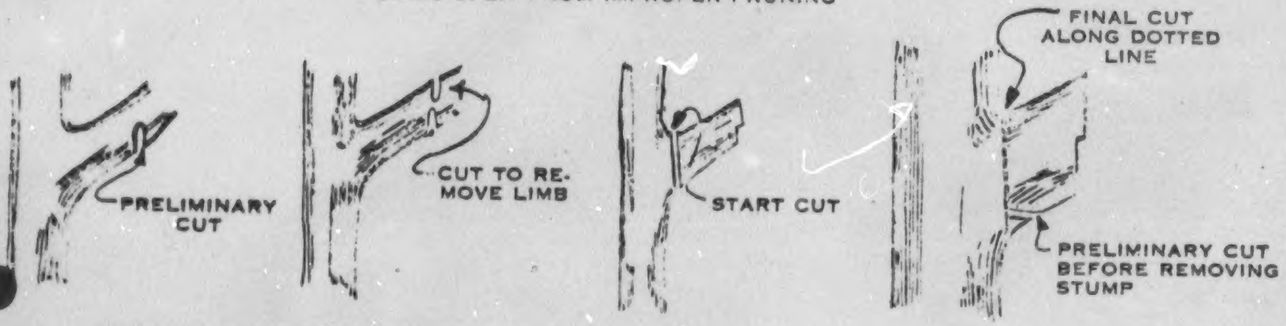
RESULTS IN DECAY


BARK
CAMBIUM
CUT
BARK
CAMBIUM
DECAY

HEALING PROCESS OF IMPROPERLY PRUNED LIMB


BARK PEELED
LIMB SPLIT

LIMBS SPLIT FROM IMPROPER PRUNING

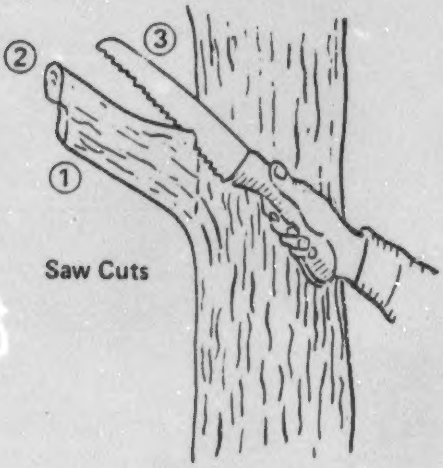

PRELIMINARY CUT
CUT TO REMOVE LIMB
START CUT
FINAL CUT ALONG DOTTED LINE
PRELIMINARY CUT BEFORE REMOVING STUMP

PROPER PROCEDURE IN PRUNING A LARGE LIMB

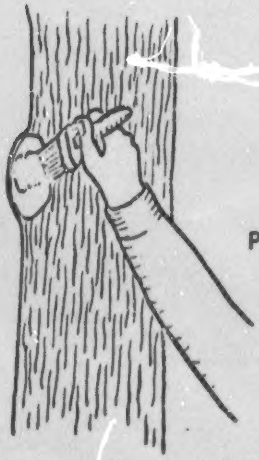
REMOVAL OF VERY LARGE LIMB

Incorrect and correct pruning methods.

# Tree Care



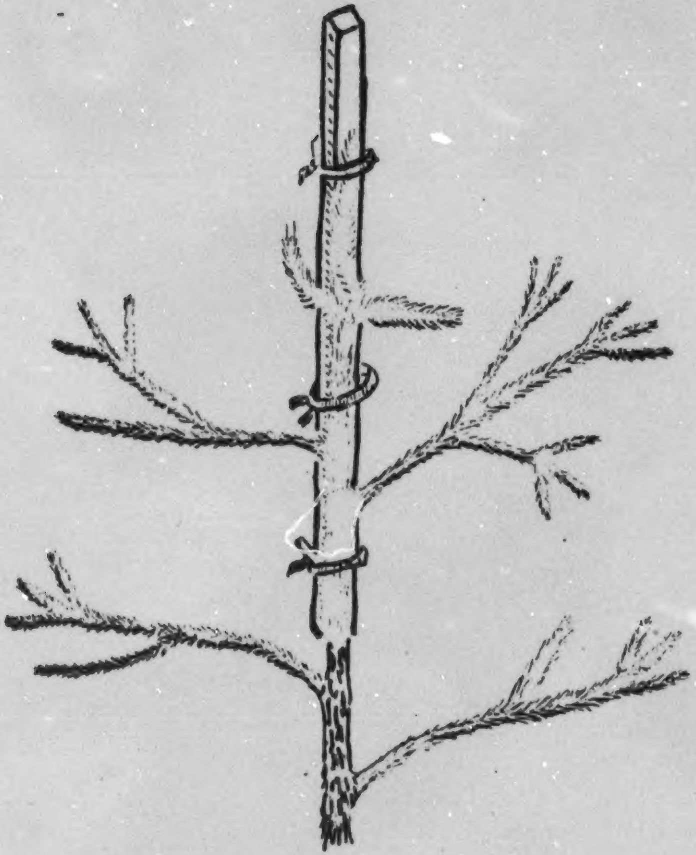
Saw Cuts



Painting Wounds

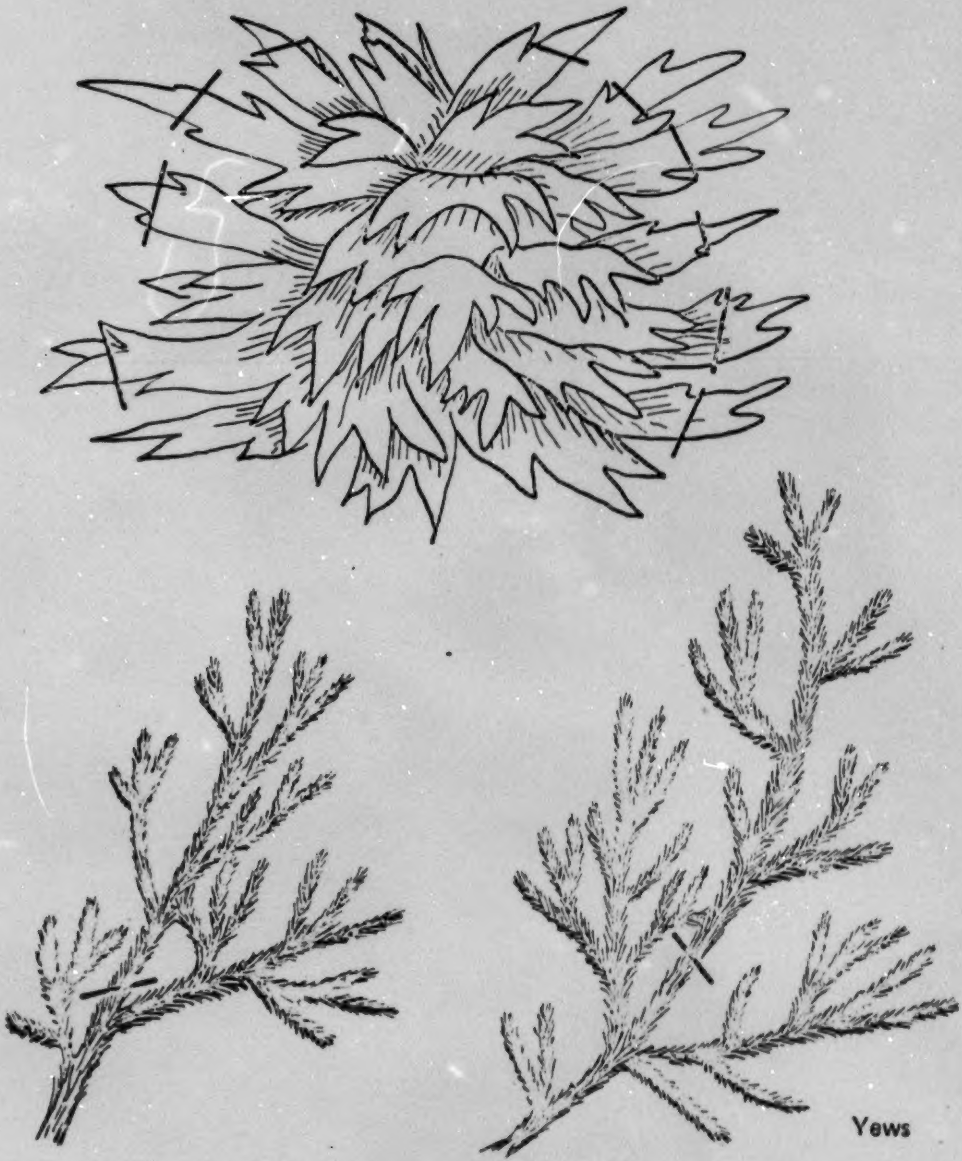
To prevent stripping the bark, make a saw cut at 1 and then a second cut at 2 when removing a limb. A third cut at 3 is required to avoid leaving a stub. Failure to remove a stub may provide entry points for disease organisms. Tree wounds should be painted (asphalt or tree paints) after removing loose or injured bark. Shape the cut (30-45°) so it slopes in a downward direction. A shallower angle permits water to soak into the wood.

# Leader



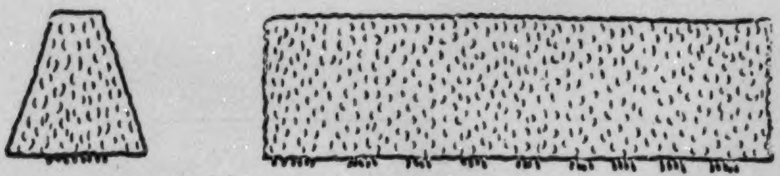
Loss of the main shoot of pines and spruces can be corrected by developing a new leader. Select a healthy branch in the top whorl of growth. Bend the shoot upwards and tie it to a splint which in turn has been attached to the main stem. The selected shoot should begin to function as the new leader in from one to two years.

# Pruning Evergreens

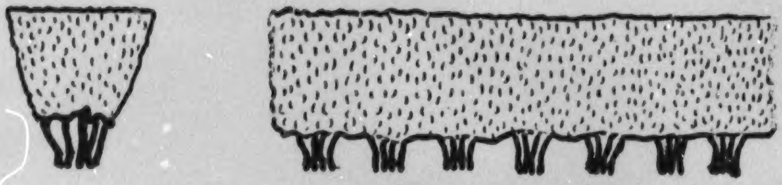


An early and regular pruning program removing several inches of most branches permits one to properly shape and develop an evergreen with dense foliage to the ground. A more severe cutback will be required if one waits several years and this generally mars the appearance of the plant. Long branches may be cut back to a side shoot bearing many needles. Yews bear dormant buds on the stem and thus you can prune back to a desired length which may be several inches above a side branch.

# Pruning Formal Hedges

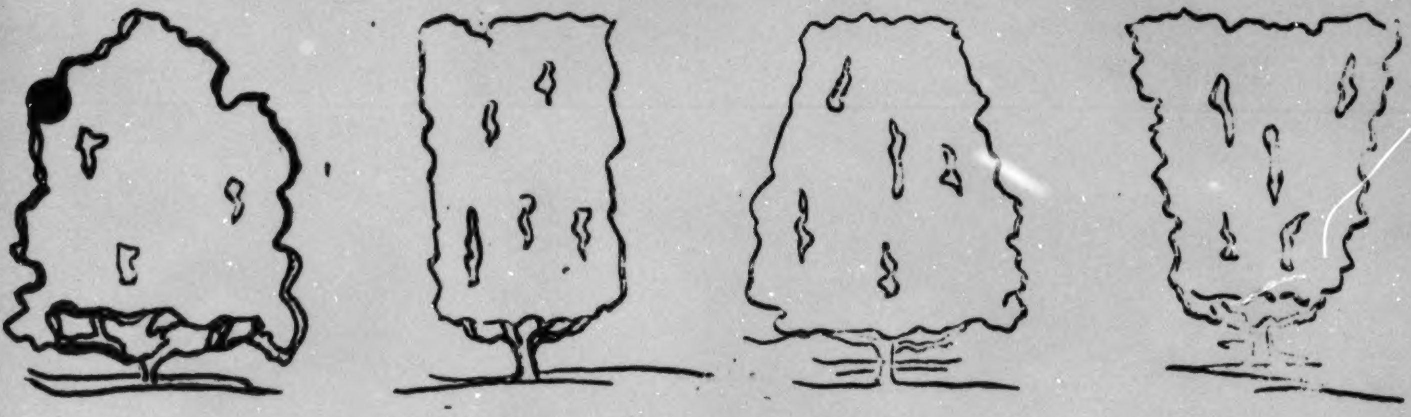


Right



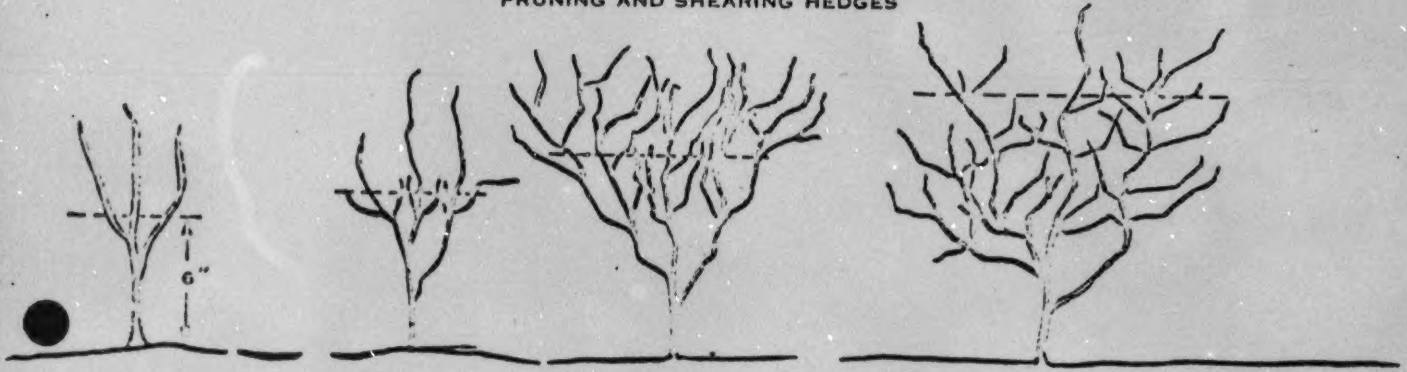
Wrong

The secret of developing an attractive formal hedge is to shape it so that the base is wider than the top. This permits light to reach the lower leaves and encourages healthy, green foliage all the way to the ground. As a general rule, prune off half the new growth when the shoots reach a length of from six to twelve inches. A pruning in late spring or early summer and again in late summer or early fall will keep the plants in good form.



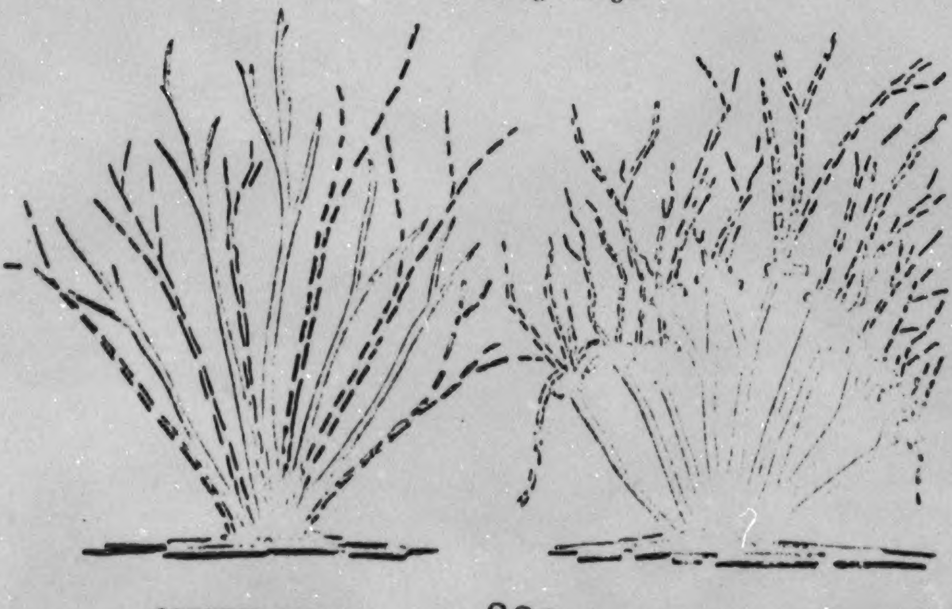
NATURAL HEDGE FAIR SHAPE GOOD SHAPE POOR SHAPE

PRUNING AND SHEARING HEDGES



PLANTING FIRST YEAR SECOND YEAR THIRD YEAR

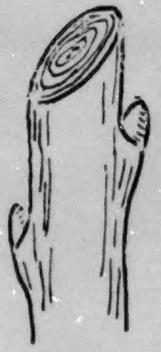
Starting a hedge.



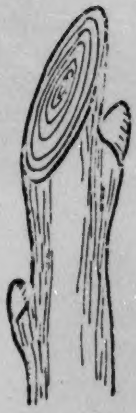
CORRECT METHOD INCORRECT METHOD

Many shrubs should be pruned by thinning out rather than heading back.

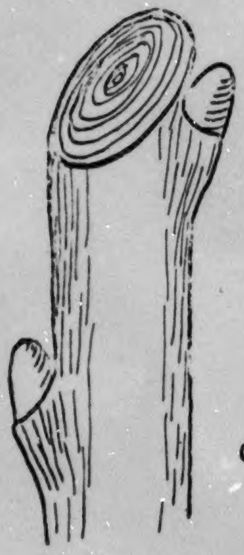
# Pruning Deciduous Shrubs



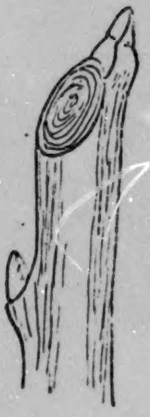
Too long a stub



Too much of a slant



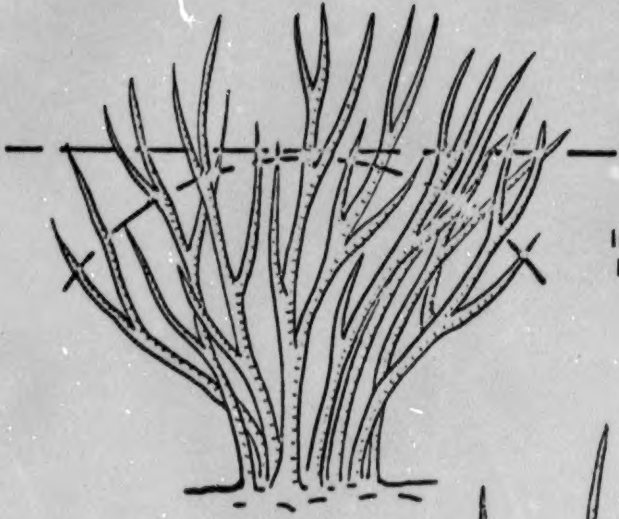
Correct



Injury to the bud

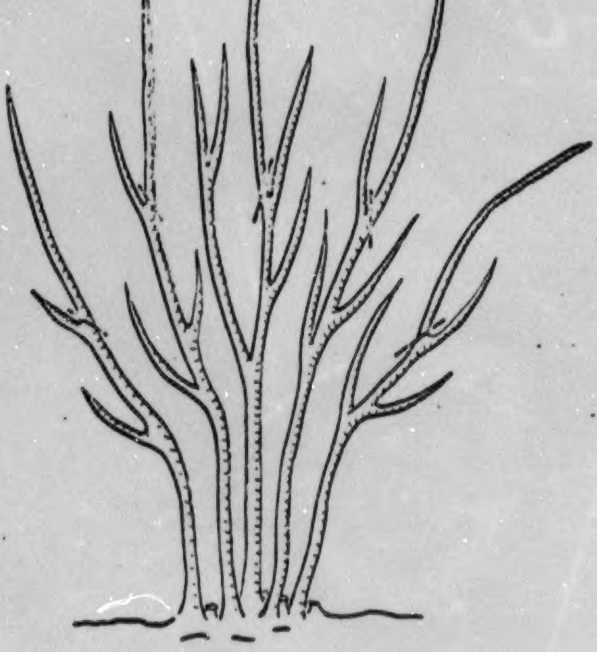
Deciduous shrubs must be pruned to restore vigor to old plants, eliminate weak and malformed branches, and to confine plants to a desired area. Early flowering shrubs should be pruned after flowering and those blooming late in the summer or fall should be trimmed in early spring before formation of flower buds. Good pruning techniques involve cutback of a shoot near to a bud facing the outside of the shrub. Do not prune too close to a bud nor leave a long stub.

# Pruning-Thinning



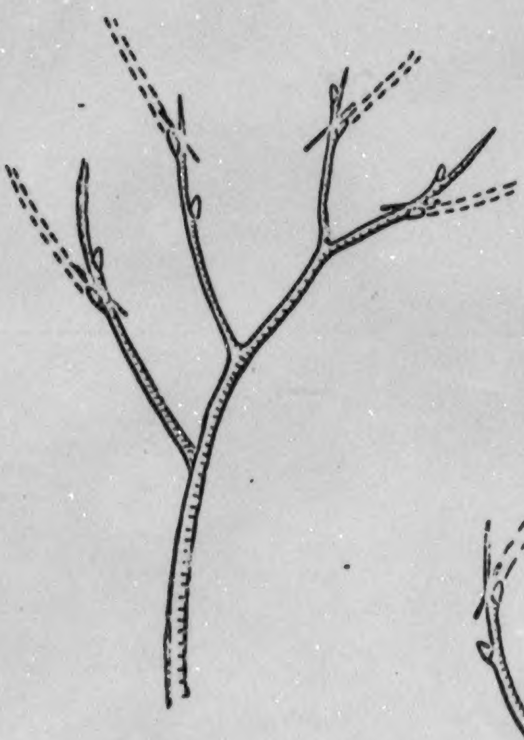
Improper
Pruning

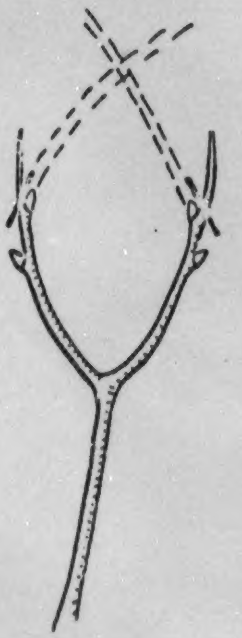
Correct
Pruning and Thinning



Spring flowering shrubs should be pruned right after their blooming period and summer flowering ones should be cut back in early spring. Systematically (yearly) remove some of the older shoots at ground level. New growth arising from the soil line will help maintain the proper shape of the plant. Never remove long branches in a straight line (hedge shape) or uniformly clip all branches in a semi circle. Those branches exceeding the desired growth pattern can be cut back to a side branch.

# Pruning

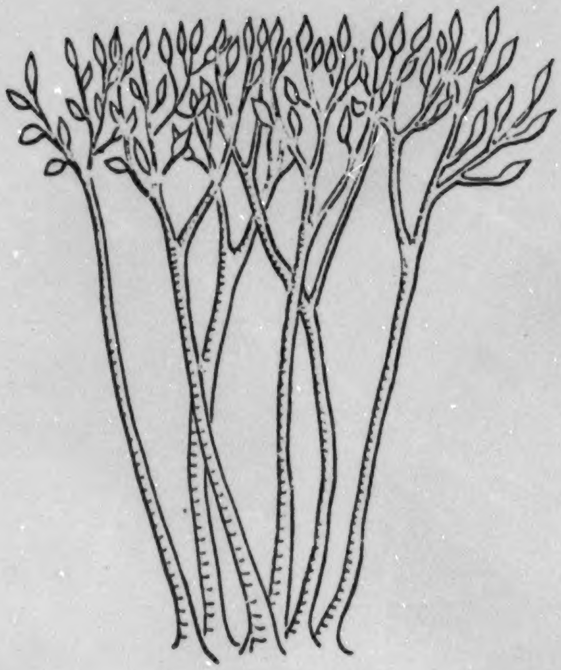


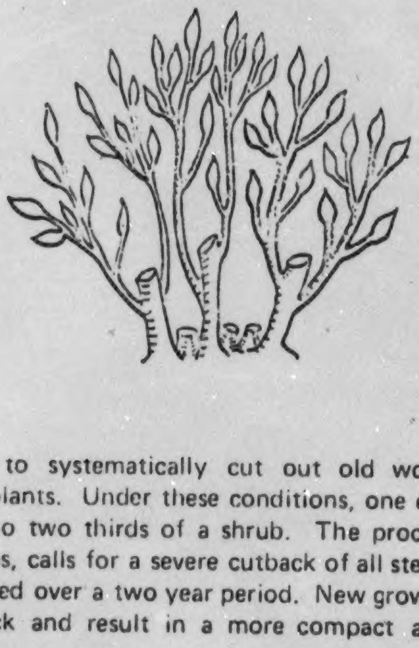


The point at which you make your cut on a stem will determine whether or not one will have a compact or spreading shrub. After the cut, the top bud will send forth a new shoot. To widen the shrub, prune back to buds facing the outside. When space is limited, you may need to prune back the buds facing the inside of the plant. If buds are opposite each other, it will be necessary to rub out or cut through the bud which you do not want to develop.

TM 12

# Rejuvenation





Overcrowding shrubs and failure to systematically cut out old wood frequently results in poorly proportioned plants. Under these conditions, one can expect few leaves on the lower one half to two thirds of a shrub. The process of rejuvenation for multiple stemmed shrubs, calls for a severe cutback of all stems near ground level. This may be accomplished over a two year period. New growth will come forth following a spring cutback and result in a more compact and productive plant.

# TREE MAINTENANCE

## UNIT 4

## TEST

1. Matching:

______a. The point or tip of a stem or branch.

______b. Pruning off the terminal portion of a twig or branch back to a bud or side twig.

______c. A complex tissue of sieve tubes and parenchyma. Responsible for the translocation of food in solution.

______d. Natural hormone produced in apical regions. It inhibits growth of lateral buds.

______e. A complex tissue of tough, fibrous, elongated cells forming vessels and woody tissue. Responsible for upward movement of water and minerals from roots to leaves.

______f. Capable of cell division.

______g. Wound tissue which develops from cambium or other exposed meristem.

______h. Pruning off entire stems or branches to give remaining stems or branches more space and reserve food.

______i. Destroying an area of phloem (bark) around the periphery of a stem resulting in death of the plant.

______j. The cylinder of meristematic tissue between the wood (xylem) and bark (phloem).

______k. The branches of a tree arising from the scaffold branches.

______l. Retains functional leaves throughout the year.

______m. The primary branches of a tree arising from the trunk of leader.

______n. Time during which no growth occurs because of unfavorable environment.

______o. Outer portion of xylem tissue and the area of upward movement of water and nutrients in a woody stem.

______p. Period of non-visible growth. Controlled by internal factors.

______q. The methodical removal of parts of a plant with the object to improve its form and to improve growth and production.

1. Pruning
2. Heading Back
3. Rest Period
4. Xylem
5. Sapwood
6. Thinning Out
7. Scaffold Branches
8. Secondary Branches
9. Apical
10. Phloem
11. Auxin
12. Meristematic
13. Callus
14. Girdling
15. Dormant Period
16. Evergreen
17. Cambium

## TEST

2. List four of the seven characteristic forms (habits of growth) of trees.

3. Identify as True or False the following statements concerning the pruning of deciduous trees.

    ______a. The ideal time to prune most trees is in early spring or winter while they are still in the dormant season.

    ______b. Spring flowering trees should be pruned while they are dormant to promote maximum flowering.

    ______c. Summer flowering trees should be pruned while they are dormant during early spring or winter.

4. Pruning wounds larger than what size in diameter should be treated with tree wound dressing?

5. Write a short discussion concerning the importance of each of the following points concerning the selection of scaffold branches.

    a. Vertical spacing

    b. Radial branch development

    c. Crotch angle

6. List two of the four functions of temporary branches on the lower part of the trunk on a young tree.

7. When planting container grown trees why is it necessary to prune off about a third of the length of twigs and small branches?

8. Diagram the method for the correct removal of a large branch through three successive cuts to prevent bark stripping.

9. How can you encourage more dense growth in pines?

10. List three of the five purposes for pruning vines.

11. Why is it important to prune a newly planted hedge?

11a. List the two types of hedge forms.

11b. Describe the correct shape for a formal hedge.

## TREE MAINTENANCE

## UNIT 4

## ANSWERS TO TEST

1. Matching:

a. 9
b. 6
c. 10
d. 11
e. 4
f. 12
g. 13
h. 2
i. 14
j. 17
k. 8
l. 16
m. 7
n. 15
o. 5
p. 3
q. 1

2. (Any four of the following seven forms, in any order)

-Irregular
-Weeping
-Vase
-Oval
-Columnar
-Pyramid
-Round

3. True or False

a. T
b. F
c. T

4. All pruning wounds more than 1½ inch in diameter should be treated with an asphaltum base wound dressing.

5. a. Vertical spacing. The major scaffold branches should be spaced at least 8 inches vertically apart, but better is 18 to 15 inches.

b. Radial development. Encourage radial branch development. No adjacent scaffold branch should be allowed to develop directly above or below another.

c. Crotch angle. Scaffold branches should have a wide crotch angle of 40° to 90° as these branches are stronger as they have more connective wood at the top.

## ANSWERS TO TEST

6. (Any two of the following, any order)

   -Temporary branches will strengthen the trunk.

   -They give protection by acting as a guard and halp to protect the trunk from possible injury caused by mowers, cars, animals, etc.

   -The trunk will increase more rapidly in base diameter.

   -Temporary branches shade the trunk and reduce the likelihood of sunburn injury to the bark and cambium.

7. The top must be pruned to compensate for the loss of roots.

8. The recommended cuts for removing a large branch are outlined in cuts 1, 2, and 3 below. The first cut (1) is made underneath the branch upward, about 15 inches away from the trunk. Cut about one-forth to one-third of the way through, stopping before the saw is jammed. The second (2) is made about 17 inches (2 inches out from cut no. 1) from the main trunk, cutting off the branch. The (3) third cut is flush with the trunk, but should be out slightly at the lower edge which will result in a smaller wound than when cut parallel to the trunk.

9. By pruning off half to two thirds of the candle-like growth.

10. (Any three of the following, any order)

    -To remove dead wood

    -To thin branches

    -To limit growth

    -To improve flowering

11. It is extremely important to prune a newly planted hedge immediately to encourage ample shoot development close to the ground so that the plants will grow into dense bushy shrubs out of which good hedges can be made.

11a. a. Informal

     b. Formal

11b. The shape of a formal hedge should be a narrow pyramid. The top of the hedge should be narrower than the base.

# LANDSCAPE NURSERY

## UNIT 5

## METHODS OF PROPAGATING AND GROWING NURSERY STOCK

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to identify the methods and principles of propagating and growing nursery stock; to select given words that pertain to the propagation and growing of plants, and to list the principles of successful propagation. This objective will be considered achieved upon attainment of a score of at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Match terms and definitions for the propagating and growing of nursery stock.
2. List the two basic ways in which plants can be propagated.
3. Identify statements as true and false concerning the propagation and growing of nursery stock.
4. Name six factors to consider in growing nursery stock.
5. a. List four advantages of growing nursery stock in containers.
   b. List six features of a desirable growing container.
   c. List six features of a desirable growing medium.

# LANDSCAPE NURSERY

## UNIT 5

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information Sheets
3. Discuss Terminal and Specific Objectives
4. Discuss Information Sheets
5. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets.
3. Transparency Masters
   TM 1 - Propagation
   TM 2 - Grafting
4. Test
5. Answers to Test

References:

1. Nursery Production. Teacher Education Series, Volume 12, No. 4t, 1971. The Pennsylvania State University College of Agriculture, Agricultural Experiment Station, Department of Agricultureal Education, University Park, Pennsylvania.
2. Denisen, Ervin L., Principles of Horticulture. The Macmillan Co., New York, N.Y.

## UNIT 5

## INFORMATION SHEET

I. Terms and Definitions

A. Aerate - cause air to circulate through.

B. Asexual or vegetative propagation - using parts of a plant (shoots, stems, leaves, roots) to produce addtional plants.

C. B & B - balled and burlapped.

D. Budding - the vegetative reproduction of plants by placing a leaf bud of the desired plant on the root stock of another plant in such a way that the two unite and grow.

E. Conductor - a material (usually a metal) that transfers heat energy.

F. Conifers - narrow leaved plants that produce seeds in cones; most of them are evergreens.

G. Crop rotation - growing different crops in succession on the same piece of land.

H. Cuttings - a vegetative portion removed (cut from the plant) for propagation.

I. Defoliation - dropping or shedding of the leaves of plants.

J. Division - the process of cutting a clump type of plant into sections.

K. Friable soil - soil that is easily crumbled or crushed.

L. Fungicide - any substance used to kill fungi or prevent the growth of spores (often loosely used to refer to any disease control material).

M. Graft - vegetative propagation by which a stem portion of one plant, having two or more vegetative buds, is joined with the roots of another plant to form one new plant.

N. Granule - small grain-like particle.

O. Harden off - exposing plants to low or varying temperatures to acclimate them to outdoor growing conditions.

P. Layer - a layered stem.

Q. Layering - the development of roots on a stem placed partially underground while still attached to the parent plant.

R. Leach - dissolved and washed away in the soil.

S. Legumes - plants belonging to the pea family with seeds enclosed in pods; the roots have nodules that contain nitrogen fixing bacteria.

T. Lining out - transplanting nursery stock into rows in the field.

U. Nemas - (nematodes) microscopic, thread like worms that may be parasites on plant roots.

V. Node - the position on the stem where leaves and buds are located.

W. Perennial - having a life cycle of more than 2 years.

X. Pinching - removing the tip of a twig, shoot, or branch to promote growth of side shoots in order to have more dense growth of the plant.

Y. Pruning - the removal of dead or living plant parts to improve the health, safety, or the shape of the plant.

Z. Scion - the upper piece of a grafted or budded plant (it forms the above ground part of the plant).

AA. Seed - an embryo or baby plantlet in a dormant condition and only requiring the right conditions to stimulate it into growth and development.

BB. Shingletow - long, thin wood shavings.

CC. Understock - the lower piece of a grafted plant (it forms the underground part of the plant).

II. Propagation of Nursery Stock

A. The primary function of a wholesale nursery is to start small plants and grow them to marketable sizes.

B. There are two basic ways that plants can be propagated. If the plants are started from seeds, the method is referred to as sexual propagation. If a part of a plant other than a seed is used to produce a new plant, it is called vegetative propagation.

C. The propagation of nursery plants from seeds, cuttings, grafts, or other means, may be done in enclosed spaces such as greenhouses or coldframes, or it may be done in outdoor beds. In certain special cases, it may be done directly in the field.

III. Propagation by Vegetative Means

A. Vegetative propagation is the process of growing a new plant by using parts of an established plant, such as roots, stems, or leaves. It is accomplished by cuttings, grafting, budding, layering, and division.

B. Cuttings are portions of stems, leaves, or roots cut from mature plants. They are placed in a moist, warm rooting medium in a greenhouse or in a coldframe with a high relative humidity and slightly reduced light intensity.

1. Advantages

   a. The rooted cutting is always a plant with characteristics that match those of the stock plant from which the cutting was taken.

   b. Many plants will produce a large plant faster from a cutting than from seeds; yew is a good example.

   c. Cutting propagation may be the only practical way to produce plants having the desired sex, as in Holly (females needed) or Ginkgo (females undesirable).

C. Grafting is the most expensive method of producing nursery plants.

1. Grafting involves fastening pieces of two plants together so that they form a new plant. It is usually done only with dormant plant material because moisture stress is low in that condition.

2. In grafting it is essential that the vascular tissues (phloem, cambium, xylem) of the cut pieces exactly match in a close smooth fit. The union takes place when new tissue (callus) develops and grows together to form new xylem, cambium, and phloem that is continuous through both parts of the plant.

D. T-budding is a special form of grafting in which a single vegetative bud, together with a small piece of bark, is inserted under the bark of young understock plants.

E. Layering: Two types of layering - simple layering and mound layering, are used for the commercial production of certain plants.

1. Simple layering consists of bending a branch of the parent plant into a U shape, with the bottom of the U held under the soil surface by means of a metal or wooden hook. To stimulate root formation, a notch or cut is usually made about 1/3 of the distance through the stem at the lowest point. A root promoting substance applied to this cut surface usually speeds root formation.

2. Mound (or stool) layering consists of cutting an established parent plant to the ground during the dormant season and mounding soil around the base of the new shoots as they develop from the stubs in spring.

F. Division

1. Division is used commercially for the propagation of plants that have a clump (or crown) growth habit.

2. The technique of dividing a plant consists simply of lifting the clump with a spading fork (to save as many roots as possible), placing the clump on its side, and cutting vertically into smaller pieces with a sharp spade.

IV. Growing Nursery Stock

A. Seed Propagation

Propagation by seed is nature's most common method of reproducing plants. Seed propagation is used commercially for many woody plants that produce seedlings that are nearly identical with the parent plant.

B. Growing Nursery Stock in the Field

1. Producing nursery stock for landscaping, conservation, reforestation, and orchards takes from 2 to 6 years from the date of propagation, depending upon the kind of plant involved, until the plants are sold.

C. Crop Rotation Plans

1. The rotation of field-grown nursery crops is somewhat more complicated than rotations for farm crops or greenhouse crops because some nursery crops require 2 years to reach marketable size, while others require 7 or more years.

2. Cover crops or green manure crops are rotated with nursery crop plants in order to replace at least a portion of the organic matter that was lost in producing the nursery crop.

D. Soil Preparation and Modification

1. The success of growing nursery stock depends to a great extent on the preparation of the soil for planting.

E. Watering

1. In plants, the need for water is indicated by a slight wilting of the leaves.
2. A simple way to test for soil moisture in the field is to insert a spade into the soil, remove a spadeful of soil and check on how well the soil from the deepest point holds together.

F. Fertilizing

1. Fertilizing nursery stock properly usually requires addition of organic matter, establishing and balancing the fertility level, and adjusting the pH.

G. Pruning and Supporting

1. Nursery stock is pruned to induce compact growth and/or to develop a desirable form.
2. When deciduous shrubs are lined out in the field, about 1/3 of the top is removed to induce the development of many more shoots near the base of the plant.
3. Narrowleaf evergreens that naturally have a rounded form are generally pruned in the same manner as deciduous shrubs when they are lined out in the field.
4. Pines are pruned by pinching or cutting back the new shoots just after the new growth is completely extended between June 15 and July 15. The terminal leader should be pruned so that no more than 10 inches of current season growth remains. The side shoots should be pruned to 4 to 6 inches in length.
5. Broadleaf evergreens, such as rhododendron and azalea, are usually tip pruned immediately after flowering, to induce compact growth through development of many branches.

H. Root Pruning

1. Root pruning is important to plants to be dug bare root as well as for those to be dug B & B.
2. The root systems of most trees and shrubs spread from 3 to 8 feet from the base of the plant. Since most soil balls are from 12 to 24 inches in diameter, unless something is done to confine the root system to the soil ball area, a considerable percentage of the roots will be lost when the plant is dug.

## X. Growing Nursery Stock in Containers

The growing of nursery stock in containers has many advantages; greater production per unit of ground area is obtained, plants are more easily handled, the growing mediums are lighter in weight, the planting season is longer, no root pruning is nedessary, cost per plant is lower, and the plants to be sold require no digging.

### A. Selecting a Container

When selecting a container, the following desirable qualities should be considered:

1. Appearance - eye appeal to the buyer.
2. Structural strenght - withstand rough handling.
3. Insulating value - protect the roots of the plant against heat and cold.
4. Durability - useful for several years.
5. Rust proof - resistant to rust.
6. Easily stored - requires minimum room for storage.
7. Weight - relatively light.
8. Stability - must have a low center of gravity.
9. Low cost - available at prices growers can afford to pay.
10. Shape - permitting normal root growth.

### B. Crop Succession Plans

1. Container grown nursery stock is usually planted in early spring although some planting is done in early fall.
2. The "rule of thumb" for proper spacing of container grown plants is that leaf tips of adjacent plants should barely touch.

### C. Growing Surfaces

1. Container nursery stock grown on bare soil presents a number of problems. The roots may grow through the drainage holes into the soil upon which the containers have been placed. Rapidly growing weeds in the soil between the containers are difficult to control. In wet weather it is difficult to work with plants that have been set on bare soil. In wet weather, the containers may fail to drain properly, causing many plant losses.
2. The least expensive solution to this problem is to place 2 mil black polyethylene sheets over carefully graded and smoothed soil. A herbicide, such as caseron, may be applied to the soil before the film is put into place.

3. Another, but costlier solution is to put down about 6 inches of crushed stone (1/2"to 3/4" diameter) over the black film and place the containers on this.

C. Growing Medium

1. A growing medium for container grown stock must satisfy the following general requirements:
    - a. Drain well.
    - b. Hold moisture well.
    - c. Be well aerated.
    - d. Have an appropriate pH range (6.0 to 7.0).
    - e. Have an adequate reserve of plant nutrients.
    - f. Be free of insects, diseases, weeds.
    - g. Be readily available and easily duplicated.
    - h. Not be too expensive.
    - i. Plants grown in the growing medium must readily develop roots after planting.
2. There is no standard soil mix for container grown plants. A basic formula would be 1 part soil, 1 part sand, 1 part peat.
3. Weeds, insects, and disease organisms that are likely to be present in these mixtures are destroyed by steaming the medium for 30 minutes at 180°F.

D. Planting

1. Container nursery stock is usually planted by hand using rooted cuttings, one year old seedlings, dormant unrooted cuttings, dormant grafts, or plants previously grown in small pots. Planting is usually done in early spring.

E. Watering

1. An adequate water supply of good quality that is available in large volume is necessary for the production of container grown nursery stock. A one gallon size container will require 1 pint of water at each watering.

F. Fertilizer Application

1. Although fertilizer usually has been incorporated into the soil mixture in which container grown nursery stock is planted, additional fertilizer is needed as the plants grow. Container grown nursery stock requires more careful fertilizing that field-grown stock because the soil volume is relatively small and the plants use the nutrients at a rapid rate.

2. For dry applications, a 10-10-10 analysis may be used, and one level teaspoonful is applied to each 1 gallon container each month in April, May, June, and July.

G. Pruning

1. Container nursery stock is pruned in order to improve the shape of the plant and to give compact growth.
2. Vines, groundcover,plants, and certain plants with a compact habit are usually not pruned.
3. Plants with a single main trunk, such as upright junipers, taxus, pines, spruces, and hemlock are allowed to develop a central leader which is not pruned.

H. Supporting

1. Container grown vines (unless to be used as groundcovers) are tied to wooden or bamboo stakes to support them in an upright position.

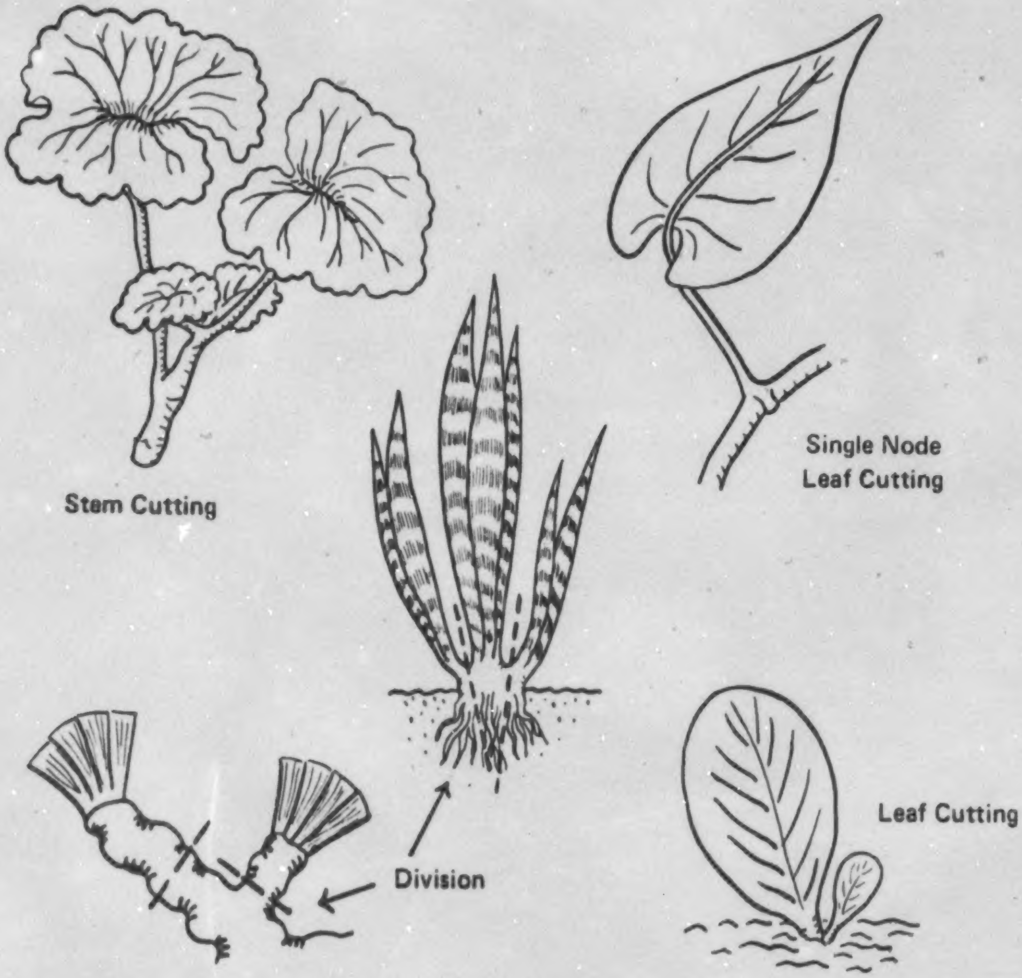
I. Winter Protection

1. With all container stock the primary winter problem is that of preventing wide temperature fluctuations in the growing medium. A common way to overcome this problem is to move the plants close together and surround each block of plants with snow fencing. A light mulch of straw (free of weed seeds) is then placed around the plants and over the tops.
2. Rabbits and mice can destroy entire blocks of certain species over the winter by eating either the bark or the entire plant when their supply of natural food has become scarce.
3. Poison baits are often used for controlling rodents, but poison must be used in such a way as not to be hazardous to children, pets, or desirable wildlife.

J. Harvesting

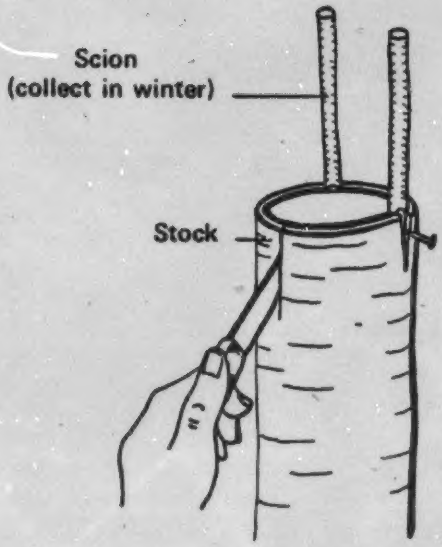
1. Container grown nursery stock is ready to be sold when it has reached an appropriate size for the container.
2. One important limitation on container grown stock is that it cannot be carried through an additional year in the same container.
3. Both container grown and B & B stock can be successfully planted at any time that the soil is not frozen, but most customers prefer to plant in the spring and early fall.

# Propagation

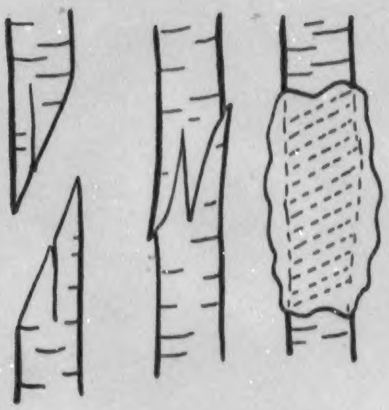


Plants can be increased in numbers (propagated) asexually by division, and leaf and stem cuttings. Bulbous plants and those sending up many stems from underground plant parts such as a rhizome can be divided with each section containing a growing point. Three to four inch stem cuttings can be taken from most plants to increase the stock of a favorite variety. When rooting leaf and stem cuttings, it is important to keep the rooting medium (peat moss, perlite) moist at all times. A plastic bag covering the container and cuttings will help hasten rooting. Keep the container in a warm location but out of direct sunlight.

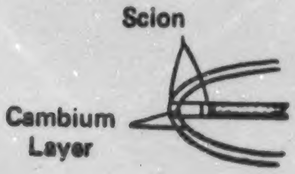
# Grafting

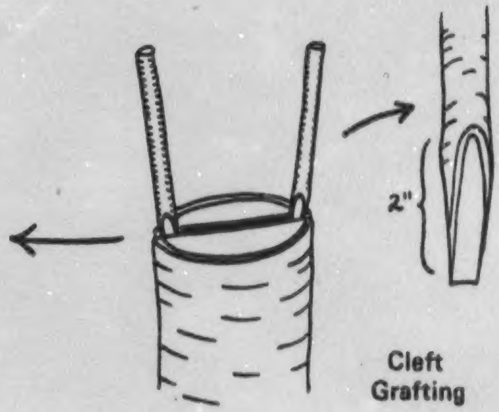


Bark Grafting



Whip Grafting





Cleft Grafting

Grafting is used as a means of propagating plants that do not reproduce true from seed, which do not root readily from cuttings; to correct an injury; and to adapt a variety to otherwise unfavorable conditions (disease, temperature) by joining it with an understock capable of producing a strong root system. The cambium layer of the scion (desired top growth) must be aligned with the cambium layer of the stock (undershoot). Deciduous trees and shrubs can be grafted during the dormant season. Grafting in the fruit orchard will be done in the spring before full bloom. A tree sealing compound must be applied over the graft.

# LANDSCAPE NURSERY

## UNIT 5

## TEST

1. Match the terms on the right with the definitions on the left.

_____a. The development of roots on a stem placed partially underground while still attached to the parent plant.

_____b. Transplanting nursery stock into rows in the field.

_____c. Propagating plants by using parts of a plant to produce additional plants.

_____d. The upper piece of a grafted or budded plant.

_____e. Vegetative propagation by which a stem portion of one plant, having two or more vegetative buds, is joined with the roots of another plant to form one new plant.

_____f. The process of cutting a clump type of plant into sections.

_____g. Exposing plants to low or varying temperatures to acclimate them to outdoor growing conditions..

_____h. A vegetative portion removed from the plant for propagation.

_____i. The lower piece of a grafted plant.

_____j. The propagation method of plants by placing a leaf bud of the desired plant on the root stock of another plant in such a way that the two unite and grow.

1. Asexual or Vegetative propagation
2. Budding
3. Cuttings
4. Division
5. Graft
6. Harden off
7. Layering
8. Lining out
9. Scion
10. Understock

2. List the two basic way plants can be propagated.

3. Identify as True or False the following statements concerning the propagation and growing of nursery stock.

_____a. A plant produced from a seed always has the characteristics that match those of the parent plant from which the seed was produced.

_____b. Cutting propagation is a practical way to produce plants having the desired sex.

_____c. Grafting is the least expensive method of producing nursery plants.

_____d. Layering involves fastening pieces of two plants together so that they form a new plant.

_____e. Nursery stock is pruned to induce compact growth and/or to develop a desirable form.

## TEST

4. Name six factors to consider in growing nursery stock.

5. a. List four advantages of growing nursery stock in containers.

   b. List six features of a desirable growing container.

   c. List six requirements for a desirable growing medium.

## LANDSCAPE NURSERY

## UNIT 5

## ANSWERS TO TEST

1. Matching

   a. 7
   b. 8
   c. 1
   d. 9
   e. 5
   f. 4
   g. 6
   h. 3
   mi. 10
   j. 2

2. Plants are started from seed or from parts of the plant other than the seed.

3. a. False
   b. True
   c. False
   d. False
   e. True

4. Any six of the following:

   Seed propagation
   Growing nursery stock in the field
   Crop rotation plans
   Soil preparation and modification
   Watering
   Fertilizing
   Pruning and supporting
   Root pruning

5. a. Any four of the following:

   Greater production per unit of ground area
   Plants are more easily handled
   The growing mediums are lighter in weight
   The planting season is longer
   No root pruning is necessary
   Cost per plant is lower
   Plants to be sold require no digging

# ANSWERS TO TEST

b. Any six of the following:

Appearance with eye appeal

Structural strength

Insulating value to protect roots

Durability

Rustproof

Easily stored, minimum room required

Relatively light weight

Stability with a low center of gravity

Low cost

Shape permits normal root growth

c. Any six requirements from the following:

Well drained medium

Holds moisture well

Well aerated

pH range from 6.0 to 7.0

Reserve of plant nutrients

Free from insects, diseases, and weeds

Readily available and easily duplicated

Not too expensive

Plants grown in the medium must readily develop roots after planting.

# LAWN MAINTENANCE

## UNIT 1

## WARM SEASON GRASSES

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to define turf grass terms; to describe the benefits of a good turf grass lawn using warm season grasses hardy for our area; and be able to perform tasks pertaining to preparation of soil, vegetative planting, fertilizing, watering, and first mowing of a new lawn; to identify and be able to correct problems pertaining to insects, disease, and weeds. This objective will be considered achieved upon attainment of a score of at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Match terms and definitions that pertain to growing warm season grasses.
2. List three advantages of growing warm season grasses.
3. Name four problems concerning warm season grasses.
4. Identify as true or false statements pertaining to warm season grasses for Kansas.
5. List three vegetative methods of planting warm season grasses.
6. Identify as true or false statements pertaining to lawn maintenance of warm season grasses.
7. Name five steps in renovating a zoysia lawn.

# LAWN MAINTENANCE

## UNIT 1

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information and Assignment Sheets
3. Discuss Terminal and Specific Objectives
4. Discuss Information and Assignment Sheets
5. Take Test.

Optional Enrichment Activities:

1. Tour local area and observe varieties of grasses and how they grow

Students:

1. Read Objectives
2. Study Information Sheets
3. Complete Assignment Sheets and turn in to instructor
4. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Assignment Sheets
    #1 - Importance of Lawns
    #2 - Maintaining a Lawn
4. Test
5. Answers to Test

References:

1. Turf Management, Musser, American Nurseryman.
2. Turf Science, Hanson-Juska, American Nurseryman.
3. Sprague, Howard B., Turf Management Handbook, The Interstate Printers & Publishers, Inc., Danville, Illinois, 1976.

# LAWN MAINTENANCE

## UNIT 1

## INFORMATION SHEET

I. Terms and Definitions

   A. Vegetative - Reproduction of assexual plants.

   B. Warm season grass - Grows best in hot weather, greening in April and turning brown in October.

   C. Sprig - Roots of grass with soil removed.

   D. Thatch - Build-up of dead grass above the soil resulting from grass killed back over the winter.

II. Warm Season Grass as a Carpet in Open Areas

   A. Becomes green in April and early May.

   B. Thrives in hot weather - heavy root feeder.

   C. Crowds out other grasses and weeds.

   D. Prefers sun to shade locations.

   E. Takes heavy traffic.

III. Problems in Growing Warm Season Grasses in Kansas

   A. Requires moist winter conditions.

   B. Difficult to grow in Western Kansas due to cold winter temperatures and low moisture and humidity.

   C. 5 to 6 months of green grass.

   D. Winter damage in severe winters.

   E. Will not tolerate much shade.

IV. Identification and Growth Habits of Warm Season Grasses

   A. Kinds of warm season grasses

      1. Zoysia

         a. Hybrid - Does not come true from seed.

         b. May be planted from plugs, sprigs, or sod.

         c. Has both rhizome and stolons; roots and spreads by runner.

         d. Produces an upright blade and dense turf.

         e. Stays green 5 to 6 months of the year.

         f. Hardiest form is Meyer 52, while Emerald is grown in southcentral and southeast Kansas.

         g. Slow grower and will crowd out competition.

         h. Will tolerate light shade as well as sun.

## INFORMATION SHEET

- i. Other name varieties not hardy in Kansas.
- j. Hardest of all grasses to mow.

2. Bermuda
    - a. Hardiest variety: U-3 - a hybrid.
    - b. Less winter hardy than zoysia.
    - c. Best used in sunny locations - becomes leggy reaching for light.
    - d. Gray green grass with runner type roots.
    - e. Very likely to grow where you do not want it to grow.
    - f. U-3 seed has been on the market but it will not come true from seed.
    - g. Less hardy strains fo Bermuda will winter kill.
3. Other warm season grasses
    - a. St. Augustine and Centipede not hardy in Kansas.

B. Planting Warm and Cool Season Grasses Vegetatively

1. By plugs - 2" square
    - a. A yard of sod produces 324 plugs, but for estimating purposes use 300 plugs per yard.
    - b. Some varieties of blue grass may be planted by plugging.
2. By sprigs
    - a. Roots of grass with soil removed.
    - b. Remove soil be putting sod through a soil grinder.
    - c. Broadcast sprigs and disc in with tractor.
    - d. Secret of good growth is to keep planted area moist - Do Not Let Soil Dry Out.
3. By Laying Sod
    - a. Blue grass, zoysia, and Bermuda.
    - b. Blue grass, rolls are 18" by 6' or 1 yard.
    - c. Zoysia and Bermuda have more soil on roots - cut 12" x 24", too thick to roll.

C. Best Time to Start Lawns Vegetatively

1. Warm season grasses
    - a. When grass begins to green, about April.
    - b. Plant anytime during summer until September first.

## INFORMATION SHEET

2. Cool Season Grasses
    a. Spring, summer, and fall.
    b. No problem as long as it is watered properly.
    c. Weeds can be a problem.

D. Soil pH for Warm Season Grasses
    1. All will thrive in 6.0 to 7.0 range.
    2. Above 7.0 lawns show iron deficiency.

V. Establishing a Lawn by Vegetative Planting
    A. Removal of debris and construction material.
    B. Grading the subsoil for proper drainage.
    C. Application of top soil and completing the finished grade.
    D. Preparation of soil for plugs, sprigs, or sod.
        1. Same procedure as discussed in Turf Grass Management I on soil preparation.
    E. Planting by 2" plugs.
        1. Blue grass and Bermuda - Spacing on 12" centers.
        2. 300 plugs will plant 300 square feet.
        3. Zoysia, a slow grower, is spaced on 8" centers - to cover in one growing season.
        4. Dig a small hole with trowel, set plug, and firm in by stepping on plugs.
    F. Planting sprigs
        1. Plant in shallow trenches and cover with soil.
        2. Broadcast sprigs and disc in with tractor.
        3. Secret of good growth is to keep planted area moist; do not let soil dry out until growth begins.
    G. Laying sod
        1. Sod is laid on finished grade.
        2. Place sod as close as possible to the next section without overlapping.
        3. Do not leave holes or gaps between sections.
        4. If holes appear fill in with sod.
        5. Small gaps fill in with soil.
        6. Weeds will appear in the holes later.
        7. Sod may buckle - if so, sod dries and dies.

INFORMATION SHEET

H. Fertilizing the grass area

1. May be incorporated into the top soil before planting.
2. Add fertilizer 2 to 3 weeks after planting or when new growth begins to appear.
3. Use a low nitrogen and non-burning fertilizer for the first feeding.

I. Watering the new grass

1. Keep moist until growth starts.
2. Amount of water applied depends on temperature and drying winds.
3. Water as needed.

J. Mowing New Lawns

1. Forces new grass to spread out.
2. Holds back weeds - less competition.
3. Mow as growth requires it.

VI. Maintenance of Warm Season Lawns

A. Mowing

1. First mowing in April when still brown.
2. Time to remove thatch in Zoysia and Bermuda.
3. May take 2 or 3 runs with power rake to remove thatch.
4. Set mower at 1½ inches.
5. Remove clippings.
6. In good growing weather mow every 5 days.
7. Do not remove more than 1/3 of the blade surface at one clipping.
8. Mowing height - 1½" all summer.
9. Reel type mower prepared for Zoysia or Bermuda.

B. Fertilizer for warm season grasses

1. April - for Zoysia use Bonus-S Kills weeds and gives Zoysia a good nitrogen feeding.
2. May burn Bermuda but won't kill it.
3. Follow-up in June with balanced lawn fertilizer-urea type.
4. For faster growth Zoysia and Bermuda may be fed once a month through August.
5. Do not feed in September.

C. Watering

1. Grass requires 1" of moisture a week.

2. Zoysia grass needing water will indicate by:
    a. Blade will shrivel and lose color.
    b. Blade is narrower and shorter and has dull green color.
    c. Grass blades do not bounce back after stepping on the grass.
    d. Easy to detect by observation.
    e. Zoysia revives quickly with a good watering.
3. Zoysia needs more watering than Bermuda.
4. Application by hand, overhead sprinklers, or underground watering system.
5. Early morning watering gives best coverage with least suspectibility to fungus.

VII. Insect and Disease Problems in Warm Season Grasses

A. Disease problems
1. Zoysia - fungus has been a problem.
    a. Leaf spot - attacks Zoysia with a build up of thatch.
    b. Rainy period in May or June with high humidity, cloudy days and temperature in the 70's, the fungus becomes active.
2. Bermuda to date is free of disease problems.
    1. Zoysia - Chinch bug has appeared in Kansas in the last few years.
        a. Sucking insect - small sucking insect.
        b. Kill large patches of Zoysia quickly.
        c. Irregular brown spots appear in July and August.

VIII. Other Damage to Zoysia and Bermuda

A. Winter damage during cold, dry periods.
B. Bermuda more susceptible to damage than Zoysia.
C. Both grasses become border line plants in most of Kansas.

IX. Weeds in Warm Grass Lawns

A. Major problem is in the first two years of getting a lawn established by plugs or sprigs.
B. Control by spraying of 2-4-D or dry form of weed killer to eliminate weeds .
    1. May take more than one application depending on type of weeds.
    2. Both broadleaf and grass like weeds may be controlled with liquid or dry application.
    3. Check with your local source for best control and results.

INFORMATION SHEET

C. Good thick stand of Zoysia or Bermuda will crowd out most weeds

X. Renovate a Warm Season Lawn

A. Damage from winter kills or chinch bug

1. Move in April as close as your mower will permit
2. Remove clippings
3. Power rake damaged area to loosen dead grass and roots
4. Remove dead grass and roots
5. Power rake deeper to loosen soil
6. Plug or sod area
7. Closer the plugs are placed together the quicker the lawn is back to normal
8. Mow, water, and fertilize to regain a healthy lawn

## WARM SEASON GRASSES

## UNIT 1

## ASSIGNMENT SHEET #1: Importance of Lawns

I. State the importance of having a well landscaped home with an excellent stand of grass to improve your local environmental conditions.

II. Select a lawn in your school area, list the problems of that lawn and state the steps necessary to put the lawn in A-1 condition.

III. A customer has a front lawn area who wants either to plug with Zoysia or sod with grass. Select a home near you and use grass suitable for your area. Show cost of sod or plugs plus manhours to prepare the soil to installation of grass plus watering. What would you charge to do the job?

# WARM SEASON GRASSES

## UNIT 1

## ASSIGNMENT SHEET #2: Maintaining a Lawn.

I. Work out a maintenance schedule, starting in April and ending in October, for a home of your choosing, the jobs to do each month and the manhours necessary to complete each job. This includes mowing watering, fertilizing, spraying, upkeep of equipment, and hand trimming and edging, but not the cost of materials used. What would you charge to do the job?

## WARM SEASON GRASSES

## UNIT 1

## TEST

1. Match the definitions on the right with the terms on the left:

______a. Sprigs
______b. Thatch
______c. Vegetative
______d. Warm season grass

1. Buildup of dead grass from winter kill back.
2. Reproduction of plants by a asexual propagation.
3. Grasses that thrive best during the summer months.
4. Roots of grass with soil removed.

2. List three advantages of planting warm season grasses.

3. Name four problems concerning warm season grasses for Kansas.

4. Identify as True or False the following statements pertaining to warm season grasses for Kansas.

______a. Zoysia and Bermuda come true from seed.
______b. Zoysia produces an upright blade as well as a runner type root system.
______c. Warm season grasses are considered harder to mow than cool season grasses.
______d. A good stand of Zoysia will crowd out weeds.
______e. Bermuda prefers to grow in shade.
______f. Meyer-52 is considered the hardiest variety of Zoysia in Kansas.
______g. Bermuda is considered hardier than Zoysia.
______h. Zoysia is considered a fast grower while Bermuda is a slow grower.

5. List three vegetative methods of planting warm season grasses.

6. Identify as True or False the following statements pertaining to the maintenance of a warm season grass:

______a. Do not remove over 1/3" of the blade surface when mowing.
______b. Zoysia is mowed at 1½" all season.
______c. A rotary mower is better for cutting Zoysia than a reel type.
______d. Warm season grasses are considered weak growers.
______e. If Bermuda and Zoysia were planted in the same area the Bermuda would eventually take over.
______f. Bermuda requires more water than Zoysia.
______g. Chinch bugs have beocme a serious problem in Zoysia.
______h. The best uniform method of watering a lawn is by hand.

7. Name five steps in renovating a Zoysia lawn.

# WARM SEASON GRASSES

## UNIT 1

## ANSWERS TO TEST

|  |  |  |  |  |
|---|---|---|---|---|
| 1. | a. | 4 | c. | 2 |
|  | b. | 1 | d. | 3 |

2. Any three of the following:
   1. Thrives in hot weather
   2. Crowds out other grasses and weeds
   3. Like walking on a carpet
   4. Strong root system
   5. Takes heavy traffic
3. Any four of the following:
   1. Cold temperatures
   2. Low humidity
   3. Not recommended for shady locations
   4. Green grass only 5 to 6 months a year
   5. Likes moisture in the winter

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| 4. | a. False | | d. True | | g. False | |
|  | b. True | | e. False | | h. False | |
|  | c. True | | f. True | | | |

5. Plugging
   Sodding
   Sprigging

|  |  |  |  |
|---|---|---|---|
| 6. | a. True | d. False | g. True |
|  | b. True | e. False | h. False |
|  | c. False | f. False | |

7. 1. Remove thatch in April or just prior to grass starting to grow.
   2. Mow as closely as your mower will permmit.
   3. Remove clippings.
   4. Use power rake as many times as needed to remove dead grass.
   5. Do not disturb anymore runner type roots (stolons) than necessary.

# GARDEN CENTER

## UNIT 1

## GARDEN CENTER OPERATIONS

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to define terms used in garden center operations; to identify plants for sale as well as dry lines or related horticultural products which aid in the growth and care of plants; be able to perform tasks pertaining to merchandising or displaying plants or dry lines for sale; to describe how to properly handle walk-in or telephone customers and proper procedure in closing a sale. This objective will be considered achieved by scoring at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Match terms and definitions pertaining to garden centers.
2. Properly identify a plant and inform customer how to use it correctly.
3. Evaluate customer needs and make suggestions and recommendations for correct usage.
4. Demonstrate the ability to close a sale and make out tickets that are readable and correct.
5. Demonstrate the proper use of the telephone and recording of messages.
6. Identify as True or False statements concerning merchandising.
7. Check all merchandise on display to be sure it is properly labeled and priced.
8. Be able to recognize insect, disease, or weed problems and make proper recommendations for their control.
9. Demonstrate the ability to receive wholesale orders, check for damaged merchandise, and account and sign for all items on the shipping ticket.
10. State the proper handling and care of plants, including watering, for plants ready for sale.
11. Demonstrate the proper use and care of trucks or vans used for delivery purposes.

# GARDEN CENTER OPERATIONS

## UNIT 1

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information and Assignment Sheets
3. Discuss Terminal and Specific Objectives
4. Discuss Information and Assignment Sheets
5. Take Test

Optional enrichment activities:

1. Visit a garden center or retail nursery and observe the displays and selling of plant material and dry line products.

Students:

1. Read Objectives
2. Study Information Sheets
3. Complete Assignment Sheets and turn in to instructor
4. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Assignment Sheets
   #1 - Self-analysis of Interest in Sales Work
   #2 - What A Salesperson Should Know About the Product he Handles
   #3 - Rate Opening Remark to a Customer
   #4 - Creating a Desire for A Product
   #5 - Self-evaluation on Why You Did Not Make a Sale
   #6 - Plan of the Outdoor Sales Area
   #7 - Know the Plants You are Selling
4. Test
5. Answers for Assignment Sheets
6. Answers to Test

## SUGGESTED ACTIVITIES

References:

1. Operating a Garden Center, John Pinney, American Nurseryman, Chicago, Illinois, 1973.
2. The Garden Center Worker, Agricultural Education Service State Department of Education and Department of Agricultural Education, The Ohio State University, 1971.

# GARDEN CENTER OPERATIONS

## UNIT 1

## INFORMATION SHEET

I. Terms and Definitions

- A. Shade tree - a dense foliage tree grown primarily for its shade.
- B. Ornamental tree - a tree which is grown for its unique feature.
- C. Flowering shrub - a multi-stemmed plant, up to 15 feet tall, which has interesting flowers.
- D. Needle evergreen - an evergreen plant with needlelike leaves.
- E. Broadleaf evergreen - an evergreen plant with broad leaves.
- F. Annual - plant which completes its life cycle in one year.
- G. Perennial - plant with indefinite life cycle.
- H. Ground Cover - a low growing plant usually under one foot tall and perennial, used as a permanent vegetative cover for an area.
- I. Vine - a trailing plant which requires support to grow.
- J. Evergreen - a plant which retains leaves at all times.
- K. Decidious - a plant which loses its leaves during its dormant period.

II. Plant Identification and Proper Use

- A. Type of Plant
  1. Shade or ornamental tree
  2. Flowering shrub
  3. Needle or broadleaf evergreen
  4. Annual or perennial
  5. Ground cover or vining
  6. Evergreen or Decidious
- B. Landscape value
  1. How high does it grow
  2. Does it flower
  3. Fruit or berries important
  4. Does it have good fall color
  5. Is the shade dense or filtered
  6. Does the fruit, foliage or branching become a maintenance problem.
- C. Growing Conditions (Characteristics of Planting Area)
  1. Does best in sun, part shade, or shade.
  2. Prefers an acid, neutral or alkaline soil.

INFORMATION SHEET

3. Requires pest moss (or equivalent soil conditioner for good root growth)
4. Prefers a heavy, sandy, wet or loam soil for best growing conditions.
5. Should the humidity be high or low for best results.
6. Is plenty of water and porous soil necessary?

III. Understanding Customer Needs and Recommendations.

A. Properly greeting a customer.
  1. Recognizing a customer when entering your business.
  2. Friendly (Hello without asking their needs)
  3. Do they need help or do they wish to browse.

B. Learn customer needs.
  1. Do they need a plant for a particular location?
    a. How big can it grow.
    b. Does it need sun or shade
    c. Fast or slow growing
    d. What landscape value will it provide.
  2. They may be looking for all summer bloom.
    a. Bedding plants
      1. Color of bloom
      2. Height
      3. Colorful foliage
    b. Roses
      1. Type - Hybrides, climbing, floribunda, and grandiflora.
      2. Color, height and habit of growth.
  3. Using the right plant in the right location.

IV. Making a Sale and Writing Out a Ticket.

A. Steps in a sales transaction
  1. Approaching a customer
  2. Creating interest, attention, or desire
  3. Handling objections
  4. Substitute selling
  5. Sales of related items
  6. Closing the sale

B. Once sale is closed.

INFORMATION SHEET

1. Cash, credit card or charge
2. Load into customer's car
3. Write up a ticket
    a. Name and Address, date
    b. List of material and costs
    c. Sales tax and total sales
    d. Paid or charge
    e. Initialed by sales person
    f. Should be readable and spelling correct

V. Proper Use of Telephone and Recording Messages.

A. Properly identify business when answering the telephone.

1. Customer likes to know who they are talking to
2. Do not use the first name of the customer unless on a very friendly basis.
3. Customer likes to be identified by name.
4. Customer will know if his call will be handled promptly and efficiently.
5. Let the customer know you appreciate her calling your business.
6. Business phones are not for personal calls.

B. Recording Messages.

1. Messages should be readable and exact as to spelling and correct information.
2. Voice should be pleasant and show interest in the customer's conversation.

VI. Merchandising - Setting Up Displays and Restocking the Store.

A. Stocking and Restocking.

1. Filling spaces where vacancies occur.
2. Respacing products to eliminate voids.
3. Make notes of merchandise needed to be ordered from supplier.
4. Make notes of merchandise asked for not presently being stocked.
5. Know location of merchandise in the store.
6. Know what each product is used for.

B. Displaying merchandise.

1. Merchandise should be placed or stacked in a neat and orderly fashion.

INFORMATION SHEET

2. Displays should be large enough to attract attention.
3. Displays should be located near most traveled areas of the Garden Center.
4. Attractive signs should be in conjunction with displays showing name and price.
5. Location of display would be near entrance and exits, on or near check-out counter, in front of the Garden Center, and in center aisle in rear of store.
6. Use of overhead signs and banners call attention to displays.

VII. Merchandise Should be Properly Labeled and Priced.

A. Proper labeling and pricing aids customers when browsing and self-service.

1. Helps new employees to learn products.
2. Where plants are involved, cultural instructions should be included in the display.
3. When sales personnel are not busy they should acquaint themselves with products for sale.
4. Products on display should be kept neat and clean.
5. Items of a kind should be displayed in the same general area.
6. In displaying plants the low ones in front and the taller ones to the rear.
7. Interesting displays should be set up to lead the customer from one area of the Garden Center to another.

VIII. Insects, Disease and Weed Problems.

A. Insects

1. Sucking or chewing
2. Know life cycle of the insect.
3. Damage in the adult or larva stage.
4. Type of damage it does to the plant.

B. Disease

1. Virus, bacteria, or virus
2. Conditions for disease to be active
    a. Temperature
    b. Moist
    c. Cloudy
3. Can disease be controlled
4. Should plants be destroyed or disposed of

## INFORMATION SHEET

- C. Weeds
    - 1. Monocot or Dicot
    - 2. Broadleaf or Narrow leaf
    - 3. Annual or perennial
    - 4. Summer or winter grower
- D. Recognize problems and suggest controls
    - 1. Identify plant having a problem
    - 2. Will spraying with proper chemicals give control
    - 3. Is the time right to spray
    - 4. Plants may need to be removed and soil treated
    - 5. Improper care of plants.
        - 1. May need proper watering, fertilizing or growing media

IX. Receiving Wholesale Orders.

- A. Live plants
    - 1. Where to unload
    - 2. How to handle plants
        - a. Bare root, potted or balled and burlap.
    - 3. Check for damaged or broken plants.
    - 4. Be sure count is correct
- B. Dry Lines
    - 1. Unload near storage area.
    - 2. Look for damaged merchandise
    - 3. Check boxes for correct products ordered
    - 4. Check shipping ticket as material is unloaded
- C. Shipping ticket is signed by receiver
    - 1. Be sure order is there before signing.
    - 2. Any damaged or material short on ticket should be noted on ticket.

X. Caring for Plants on Display and Ready for Sale.

- A. Watering
    - 1. By hand or overhead sprinkler
    - 2. How often to water.
    - 3. How much to spray
    - 4. Wetting the soil or misting the foliage

## INFORMATION SHEET

- B. Spraying
    - 1. Evergreen - check for bagworms, red spider
    - 2. Roses - leaf spot, aphids
    - 3. Look for problems and spray as needed
- C. Respacing plants for summer display
    - 1. Allow for summer growth
    - 2. Plants too close, foliage may burn and die
    - 3. Eliminates open spaces in display.
- D. Area - Neat and clean
    - 1. Weeds removed as needed
    - 2. Keep walk ways open and dry
    - 3. Keep tools picked up and put away
    - 4. Hoses should not be a problem in the walk ways

XI. Use and Care of Delivery Trucks and Vans

- A. Care and maintenance of vehicle.
    - 1. Check list for gas, oil, lubrication
    - 2. Check lights, battery and tires
- B. Practice safe driving
    - 1. Obey speed limits at all times
    - 2. Drive with the other driver in mind
- C. Proper loading of vehicle
    - 1. Load so that material will not shift
    - 2. Improper loading may damage plants
    - 3. Where weight may be problem - distribute weight properly
- D. Appearance of vehicle and driver

## GARDEN CENTER

## UNIT 1

## ASSIGNMENT SHEET #1: Self-Analysis of Interest in Sales Work.

1. I'd rather deal with things than with people. Y N
2. I think mathematics is a very interesting subject. Y N
3. I like talking to strangers. Y N
4. I dislike group activities. Y N
5. People find it easy to approach me. Y N
6. I would like to do research in science. Y N
7. I'd enjoy raising money for a worthy cause. Y N
8. I prefer to be by myself. Y N
9. I've more than average desire to own things. Y N
10. I would like to design farm implements. Y N
11. I would like to attend conventions. Y N
12. I've more than average mechanical ingenuity. Y N
13. I dislike people who borrow things. Y N
14. I would like to be a chemical engineer. Y N
15. I like people of all nationalities in my community. Y N
16. I'd like to work a 40-hour week. Y N
17. I would enjoy making speeches. Y N
18. I'd like to be head of a research department. Y N
19. I like to keep meeting new people. Y N
20. I enjoy bargaining when I'm buying something. Y N
21. I'd like to develop some new scientific theories. Y N
22. I'd like a straight salary in my life work. Y N
23. I prefer only a few really intimate friends. Y N
24. I'm better than average at judging values. Y N
25. I like to get other people's view point. Y N

Related to Selling

What does mathematics have to do with selling?

What has talking to strangers mean to selling?

What does your desire to own things do with selling?

## ASSIGMENT SHEET #1: Self-Analysis of Interest in Sales Work.

Use the following instructions to see how you rated. Your answers indicate interests or characteristics favorable to success in sales work. If your total score is 16 or above, your chances of success in the selling field are favorable. A score below 16 indicates that you probably would have better chances of success in some other field.

GARDEN CENTER

UNIT 1

## ASSIGNMENT SHEET #2: What a Salesperson Should Know About the Products He Handles.

Name of product -

Use of product ______________________________
______________________________

How the product works (or used) ______________________________
______________________________

Instructions for using ______________________________
______________________________

Who is the manufacturer ______________________________
______________________________

Storage of product ______________________________
______________________________

Maintenance of product (if not consumable) ______________________________
______________________________

Packaging (sizes and material) ______________________________
______________________________

GARDEN CENTER

UNIT 1

## ASSIGNMENT SHEET #3: Rate Opening Remark to a Customer.

Rate the following opening remarks -

"G" Rate Good
"P" Rate Poor
"Q" Rate Questionable

_____1. Are you looking for something?
_____2. Is anyone helping you?
_____3. Good morning, Mrs. Jones. May I help you?
_____4. Are you being taken care of?
_____5. May I show you something?
_____6. May I help you?
_____7. Something for you?
_____8. Now, dearie, what may I do for you?
_____9. Anything in particular you want?
_____10. Are you next, lady?
_____11. Do you wish attention?
_____12. Something in the chemical line?
_____13. What do you want?
_____14. A dollar fifty!
_____15. Yes, ma'am?
_____16. Are you looking or do you wish to buy something?
_____17. Can I tempt you with anything today?
_____18. Good Morning!
_____19. This is a dandy value.
_____20. Is someone waiting on you?

# GARDEN CENTER

## UNIT 1

### ASSIGNMENT SHEET #4: Creating a Desire for a Product.

A fungicide for roses -
What would you say?

What would you do?

Power edger-trimmer -
What would you say?

What would you do?

Lawn fertilizer -
What would you say?

What would you do?

Grass seed -
What would you say?

What would you do?

Decorative fountain -
What would you say?

What would you do?

GARDEN CENTER

UNIT 1

## ASSIGNMENT SHEET #5: Self-evaluation on Why You Did Not Make a Sale.

1. How was my greeting, did I have a smile?
2. Was my personal appearance O.K.?
3. Did I have confidence in myself?
4. Did I have knowledge of the product?
5. Did I talk too much?
6. Did I overcome objections, or did the objections confuse me?
7. Did I use proper demonstration of the item?
8. Was any question raised that I could not answer?
9. Did I indicate the services that were available for this product?
10. Did I recognize when it was time to close the sale?

Practice making a sale with another students then rate yourself accordingly. You may have a third student rate you.

# GARDEN CENTER

## UNIT 1

### ASSIGNMENT SHEET #6: Plan of the Outdoor Sales Area.

Draw a plan to scale showing areas for plants, both under lath and in the open, on display for sale. Walkways, loading, and unloading areas should be indicated as well as type of plants to be displayed in these areas. Knowing your spacing you can figure how many plants may be placed in each area. You should provide space for shade trees, specimen evergreens, broadleaf evergreens, spreading evergreens, flowering shrubs, fruit trees, vines, ground cover, and bedding plants.

# GARDEN CENTER

## UNIT 1

## ASSIGNMENT SHEET #7: Know the Plants You are Selling.

Shade Tree

- Name
- Size
- Foliage
- Habit of Growth
- Fall color
- Color of bloom
- Time of bloom
- Fruit or berries
- Problems - if any

Specimen Evergreen

- Name
- Size
- Foliage
- Habit of Growth
- Fall color
- Color of bloom
- Time of bloom
- Fruit or berries
- Problems - if any

Flowering Shrubs

- Name
- Size
- Foliage
- Habit of Growth
- Fall color
- Color of bloom
- Time of bloom
- Fruit or berries
- Problems - if any

Broadleaf Evergreen

- Name
- Size
- Foliage
- Habit of Growth
- Fall color
- Color of bloom
- Time of bloom
- Fruit or berries
- Problems - if any

## ASSIGNMENT SHEET #7: Know the Plants You are Selling.

Vine or Ground Cover

- Name
- Size
- Foliage
- Habit of Growth
- Fall color
- Color of bloom
- Time of bloom
- Fruit or berries
- Problems - if any

Bedding Plant

- Name
- Size
- Foliage
- Habit of Growth
- Fall color
- Color of bloom
- Time of bloom
- Fruit or berries
- Problems - if any

## GARDEN CENTER

## UNIT 1

## TEST

1. Match Terms and Definitions.

______a. Plant that completes its life cycle in on year.
______b. Plant that holds leaves year round.
______c. Plant that needs support to grow.
______d. Plant that loses its foliage in the fall.
______e. Multi-stem plant to 10/15' that has interesting blooms.

1. Evergreen
2. Flowering Shrubs
3. Deciduous
4. Annual
5. Vine

2. Name four different landscape values a plant may provide.

2a. List five things you should know about an area for a certain tree to be planted.

3. Identify as "G" for Good and "P" for Poor in welcoming your customer to your store.

______a. Are you being taken care of?
______b. Anything in particular you want?
______c. Good Morning!
______d. May I help you?
______e. This is a dandy value.
______f. Sorry to keep you waiting, Mrs. Jones.
______g. Now, dearie, what may we do for you?

4. List six steps in making a sale.

4a. Name at least five items that should be recorded on a sales ticket.

5. List five points that should be covered in a business telephone call.

6. Choose from the following statements (True of False) those that pertain to displaying merchandise for sale.

______a. Large material should be placed closer to the customer, and smaller items farther from the eye.
______b. Restocking is done as vacancies occur.

TEST

______c. Sales personnel should be able to direct customer to where the merchandise is located in the store.

______d. Attractive displays will not help in moving traffic through a garden center.

______e. Dusting in a store should be done every three to four weeks.

______f. Overhead signs are not necessary for garden centers, such as used in grocery stores.

______g. Large bulky material is not hard to disply if room is available

______h. Displays should not be near entrance or exits as they interfer with traffic in the store.

______i. Restocking of shelves and reordering of merchandise should only be done by the manager.

7. Plants for sale should have two types of information visable to the customer. They are:

8. Name three areas of problems that are most common in horticulture.

9. List four steps that should be followed in receiving a wholesale order.

10. Name four areas of work necessary to keep plants for sale in good salable condition.

11. List three points to check when loading a truck for delivery.

11a. Name at least five areas of a van or truck for continued good operation of vehicle.

## GARDEN CENTER

## UNIT 1

## ANSWERS FOR ASSIGNMENT SHEET #1

1. N Dealing with people is selling.
2. N Mathematics is connected with Research and Science.
3. Y Sales people meet a lot of strangers.
4. N You like to work with others.
5. Y This makes selling easier.
6. N Usually means working individually.
7. Y This is a selling job.
8. N Individual again
9. Y This would make you think others should buy things also.
10. N Similar to research
11. Y Would be meeting people
12. N Mechanics work by themselves.
13. Y They should own their own
14. N Individual work
15. Y Meeting people
16. N Selling requires irregular hours.
17. Y Would require being among people.
18. N Individual work
19. Y Meeting people
20. Y Interest in knowing about products
21. N Individual work
22. N Sales are often on commission
23. N Meeting people
24. Y Should be able to explain to others
25. Y Would want to talk to others.

## GARDEN CENTER

## UNIT 1

## ANSWERS FOR ASSIGNMENT SHEET #3

Rate the following opening remarks -

"G" Rate Good
"P" Rate Poor
"Q" Rate Questionable

P 1. Are you looking for something?
P 2. Is anyone helping you?
G 3. Good Morning, Mrs. Jones. May I help you?
P 4. Are you being taken care of?
G 5. May I show you something?
Q 6. May I help you?
Q 7. Something for you?
P 8. Now, dearie, what may I do for you?
P 9. Anything in particular you want?
P 10. Are you next, lady?
P 11. Do you wish attention?
Q 12. Something in the chemical line?
P 13. What do you want?
Q 14. A dollar fifty!
Q 15. Yes, ma'am?
P 16. Are you looking or do you wish to buy something?
P 17. Can I tempt you with anything today?
G 18. Good Morning!
P 19. This is a dandy value.
P 20. Is someone waiting on you?

## GARDEN CENTER
## UNIT 1
## ANSWERS TO TEST

1. a. 4
   b. 1
   c. 5
   d. 3
   e. 2

2. -Height
   -Flower
   -Fruit or berries
   -Fall color
   -Habit of growth

2a. -Sun or shade location
   -Acid, neutral or alkaline (pH)
   -Clay, loam, shady soil
   -Humidity
   -Soil conditioner needed

3. a. P
   b. P
   c. G
   d. P
   e. P
   f. G
   g. P

4. -Approach a customer
   -Create attention, interest, desire
   -Handling objections
   -Substitute selling
   -Sales or related items
   -Closing the sale

4a. -Name
   -Address
   -Name of sale items
   -Cost of material
   -Total

## ANSWERS TO TEST

5. -Identify the business
-Recognize your customer
-Learn customer needs
-Supply proper information
-Thank the customer for calling

6. a. F
b. T
c. T
d. F
e. F
f. F
g. T
h. F
i. F

7. -Name
-Price

8. -Weeds
-Disease
-Insects

9. -Knowing merchandise to unload
-How to properly handle merchandise
-Check for damage or material short on order
-Sign shipping ticket

10. -Watering
-Spraying
-Spacing plants
-Area neat and clean

11. -Proper spacing of material on load
-Material will not be damaged in delivery
-Proper loading of vehicle by weight.

11a. -Gas
-Oil
-Lubrication
-Lights
-Battery
-Tires

# HORTICULTURE MECHANICS

## UNIT 1

## CONSTRUCTION OF CONCRETE FORMS AND REINFORCING CONCRETE

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to identify the characteristics of a good concrete form. They should be able to list materials used to make concrete forms. The students will be able to select reinforcing materials for a concrete construction job. They will be able to determine the location for the reinforcing materials for a concrete construction job. This objective will be considered achieved upon attainment of a score of at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Define two terms associated with concrete forms and reinforcing concrete.
2. State the purposes of concrete forms.
3. List three requirements of good concrete forms.
4. List four of the common materials used in constructing concrete forms.
5. Discuss how to brace forms.
6. Discuss when to remove forms.
7. State the purpose for concrete reinforcement.
8. List two materials used in reinforcing concrete.
9. State five rules for reinforcing concrete.

# HORTICULTURE MECHANICS

## UNIT 1

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information Sheets
3. Make transparancies
4. Discuss Terminal and Specific Objectives
5. Discuss Information Sheets
6. Additional exercise - build forms for a sidewalk.
7. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Participate in building forms for sidewalk if job is available
4. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Transparency Masters
   TM 1 - Wooden Concrete Forms
   TM 2 - Reinforcement Suggestions
4. Test
5. Answers to Test

References:

1. Making Quality Concrete for Farm Construction, #PA055T, Portland Cement Association, Old Orchard Rd., Skokie, Illinois, 60076.
2. Phipps, Lloyd J., McColly, H.F., and Scraton, L.L., Farm Mechanics Text and Handbook, The Interstate Printers and Publishers Inc., Danville, Illinois, 1967.

## HORTICULTURE MECHANICS

## UNIT 1

## INFORMATION SHEET

I. Terms and Definitions

  A. Forms - The materials that are built into the desired shape to hold the concrete, when poured, in place.

  B. Reinforcing materials - Steel bars or mesh placed in concrete to increase its tensile strength.

II. Purpose of Forms

  A. Forms hold the concrete in the shape desired until it sets or hardens enough to stand by itself.

  B. Normally, the longer the forms stay on, the stronger the concrete

  C. Forms should be kept in place at least 24 hourse on all jobs

III. Requirements of Good Forms

  A. Must be true to size and shape

  B. Should be rigidly braced to prevent bulging, sagging, and spreading

  C. Should be tight and free from openings to prevent leaking

  D. Should be easy to remove after concrete has set

IV. Constructing Forms (TM 1)

  A. To obtain a smooth finish, forms should be made of dressed, tongued, and grooved lumber. Plywood and other manufactured products may be used to obtain a smooth finish

  B. Strips of sheet metal should be used to round off sharp corners and angles to make a stronger and neater job

  C. Crude oil or crankcase oil, painted on the inside of the forms, will keep the concrete from sticking to them when they are removed.

  D. Forms should have all pieces of concrete removed from them before using again

V. Bracing Forms

  A. In addition to joining the forms with nails and wood bracing at strategic points, wire ties through the forms should be tightened against wood spacers

  B. The wood spacers should be removed as the placing of the concrete progresses

  C. Wires must be cut to remove the forms and they may be cut flush with the concrete

## INFORMATON SHEET

VI. Removing Forms

A. In warm weather, forms should remain in place two or three days

B. In cold weather, allow twice as long

C. In no case, should the forms be removed until the concrete has thoroughly set and there is no danger of damaging

D. Forms left in place for at least a week aid in the curing process by protecting the concrete from drying too rapidly

E. The weather, temperature, and nature of the work determine the length of time to leave the forms in place

VII. Reinforcement is for the Purpose of Increasing the Strength of Concrete

VIII. Materials Used for Reinforcing Concrete

A. Steel rod and wire mesh are usually used for reinforcement

B. For large jobs, engineers should be consulted for the proper type, size, and spacing of reinforcements

IX. Rules for Reinforcing Concrete (TM 2)

A. Use only clean steel (free from rust, paint, and scale)

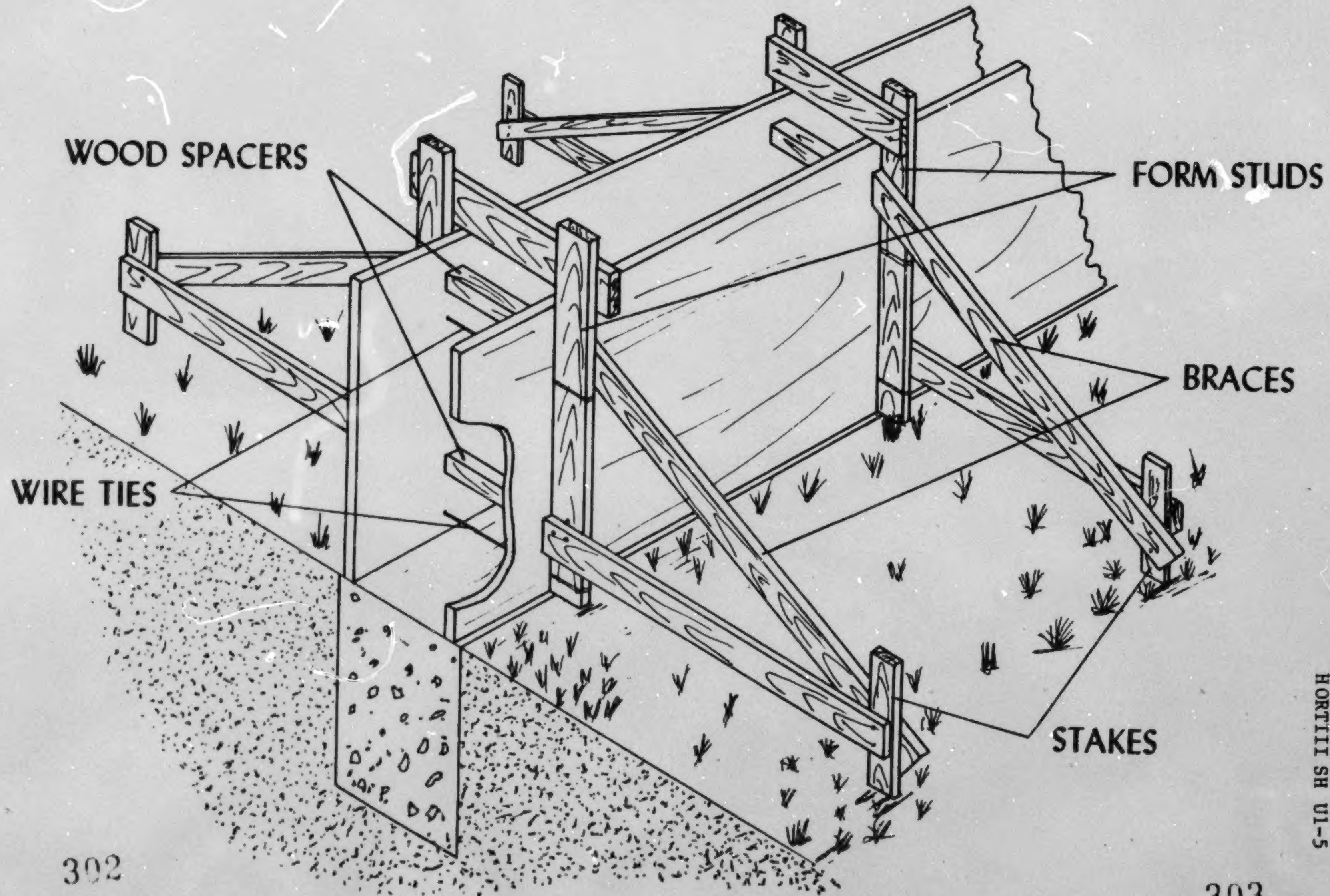
B. Place steel no closer than 3/4 inches from the outside surface

C. Lap all bars 48 times their diameter (1/2 inch bars should be lapped 24 inches and then wired together)

D. Place reinforcement where concrete will be in tension (such as corners, joints, etc.)

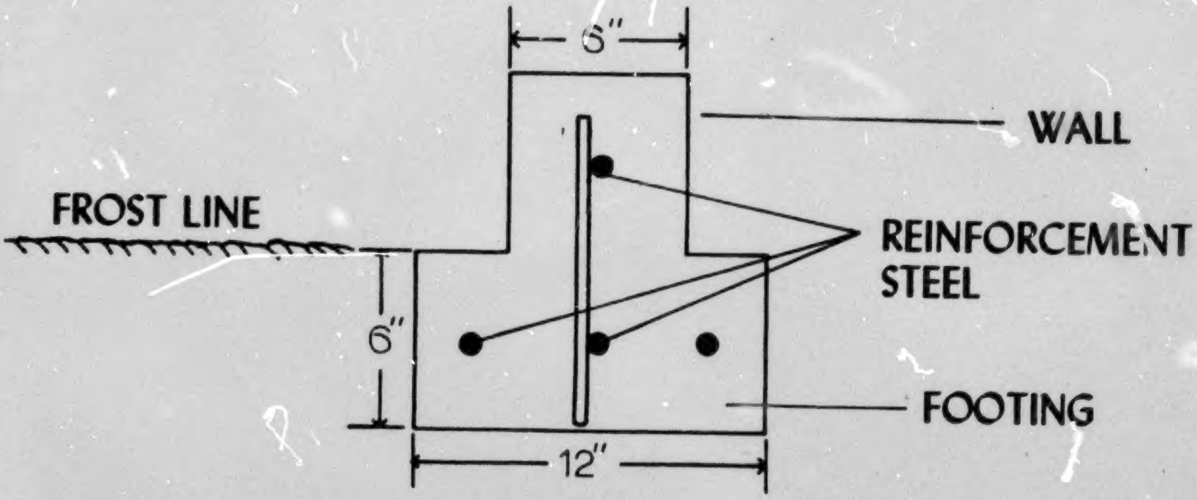
E. Position wire mesh or steel near center of depth of slab or sidewalk

# WOODEN CONCRETE FORM

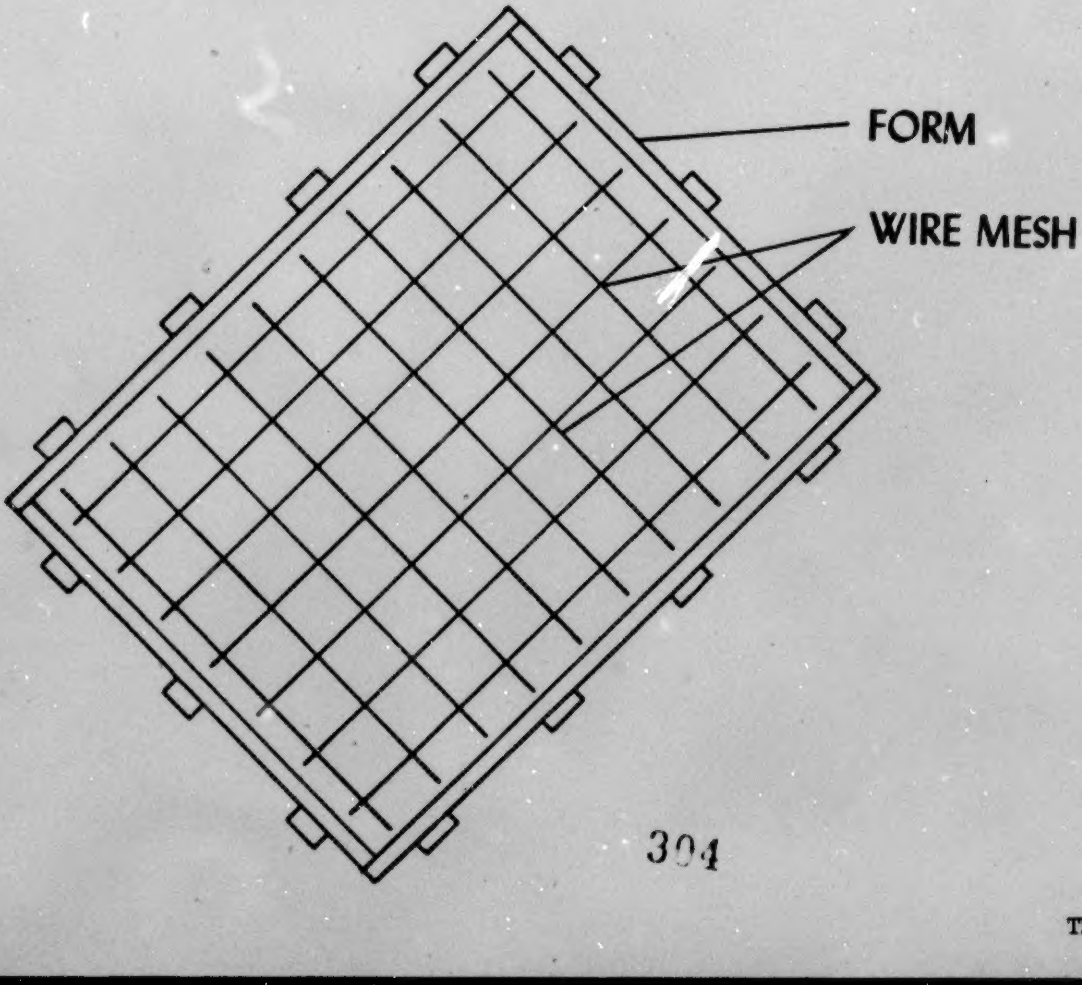

WOOD SPACERS
FORM STUDS
BRACES
WIRE TIES
STAKES

# REINFORCEMENT

## WALL AND FOOTING CROSS - SECTION


6"
WALL
FROST LINE
REINFORCEMENT STEEL
6"
FOOTING
12"

## SLAB


FORM
WIRE MESH

# HORTICULTURE MECHANICS

## UNIT 1

## TEST

1. Define two terms associated with concrete forms and reinforcing concrete.
    a. Forms
    b. Reinforcing materials
2. State the three purposes of concrete forms.
3. List three requirements of good concrete forms.
4. List four of the common materials used in constructing concrete forms.
5. Discuss in detail how to brace forms.
6. Discuss when to remove forms.
7. State the purpose for concrete reinforcement.
8. List two materials used for reinforcing concrete.
9. State five rules for reinforcing concrete.

# HORTICULTURE MECHANICS

## UNIT 1

## ANSWERS TO TEST

1. a. Forms - The materials that are built into the desired shape to hold the concrete, when poured, in place.

   b. Reinforcing materials - Steel bars or mesh placed in concrete to increase its tensile strength.

2. Forms hold the concrete in the shape desired until it sets or hardens enough to stand by itself.

3. Any of the following:

   a. Must be true to size and shape.

   b. Should be rigidly braced to prevent bulging, sagging, and spreading.

   c. Should be tight and free from openings to prevent leaking.

   d. Should be easy to remove after concrete has set.

4. Any of the following:

   a. Smooth dressed, tongued, and grooved lumber.

   b. Plywood and other manufactured products with a smooth finish.

   c. Strips of sheet metal.

   d. Oil to seal forms.

5. Discussion should include these points:

   a. Nails and wood bracing.

   b. Wire ties and wood spacers.

   c. Removal of wire ties and wood spacers.

6. Discussion should include these points:

   a. In warm weather, forms should remain in place two or three days.

   b. In cold weather, allow twice as long.

   c. In no case should the forms be removed until the concrete has thoroughly set and there is no danger of damaging.

   d. Forms left in place for at least a week aid the curing process by protecting the concrete from drying too rapidly.

   e. The weather, temperature, and nature of the work determine the length of time to leave forms in place.

7. Reinforcement is for the purpose of increasing the strength of concrete.

## ANSWERS TO TEST

8. Steel rod

   Wire mesh

9. Use only clean steel.

   Place steel no closer than 3/4 inches from the outside surface.

   Lap all bars 48 times their diameter (1/2 inch bars should be lapped 24 inches and then wired together).

   Place reinforcement where concrete will be in tension (such as corners, joints, etc.).

   Position wire mesh or steel near center of depth of slab or sidewalk.

# HORTICULTURE MECHANICS

## UNIT 2

## MATERIALS FOR QUALITY CONCRETE

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to identify portland cement characteristics and types, and select materials for quality concrete. They will also be able to determine amounts of material to use and proper mixing. This objective will be considered achieved by scoring at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Match terms associated with concrete when definitions are given.
2. List six uses of concrete in agriculture.
3. List five advantages of concrete construction.
4. Match portland cement types with characteristics of each.
5. List the ingredients used in concrete.
6. Write the approximate volume of cement, water, and aggregate in concrete.
7. Describe the makeup of a 1:2:3 concrete mixture.
8. Identify from a list the primary factor in concrete strength.
9. Complete a table on determining the moisture in sand.
10. Describe how consistency of concrete should be altered.
11. State Fuller's rule as it applies to concrete.
12. List in order the steps in machine and hand mixing of concrete.
13. List three advantages and three disadvantages of ready-mixed concrete.
14. Describe how to properly prepare for and order ready-mix.
15. Determine the amount of concrete needed for a given job.
16. Make a trial mix of concrete.

# MATERIALS FOR QUALITY CONCRETE

## UNIT 2

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information and Job Sheets
3. Make transparencies
4. Discuss Terminal and Specific Objectives
5. Discuss Information Sheet
6. Provide students with Assignment Sheets
7. Give Test
8. Tour ready-mix plant, mix concrete if time allows

Students:

1. Read Objectives
2. Study Information Sheet
3. Complete the Assignment Sheets
4. Take Test
5. Tour plant and mix concrete if time allows
6. Make trial mix of concrete

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objective sheet
2. Information Sheet
3. Transparency Masters
   - TM 1 - Volume of Materials in Concrete
   - TM 2 - Moisture in Sand
   - TM 3 - Recommended Mixtures and Fuller's Rule
4. Assignment Sheets
   - #1 - Applying Fuller"s Rule
   - #2 - Determining Cubic Yards
5. Job Sheet
   - #1 - A Trial Batch of Concrete
6. Answers to Assignment Sheets #1 and #2
7. Test
8. Answers to Test

## SUGGESTED ACTIVITIES

References:

1. Concrete: Suggested Lesson Plans for Teachers of Vocational Agriculture, Ag Ed Department, Texas A&M University, College Station, Texas.
2. Quality Concrete, Hobar Publications, 1305 Tiller Lane, St. Paul, Minnesota 55112.
3. Making Quality Concrete for Farm Construction, #PA055T, Portland Cement Association, Old Orchard Rd., Skokie, Illinois, 60076.
4. Design and Control of Concrete Mixtures, #EB001T, Portland Cement Association, Old Orchard Rd., Skokie, Illinois 60076.

# MATERIALS FOR QUALITY CONCRETE

## UNIT 2

## INFORMATION SHEET

I. Terms and Definitions

- A. Concrete - a mixture of a paste of portland cement and water, binding fine and coarse aggregates, into a rock-like mass as the paste hardens through chemical reaction.
- B. Cement - manufactured product of lime, iron oxide, silica, and alumina
- C. Sand - (fine aggregate) particles that range from very fine to 1/4 inch in diameter.
- D. Gravel - (coarse aggregate) particles range from 1/4 to 1 1/2 inches.
- E. Fuller's Rule - states that the mixing of a total of 42 volumes of cement, sand, and gravel will produce 27 volumes of concrete.
- F. Water-Cement ratio - the ratio of water to cement usually expressed in gallons per bag of cement.

II. Agricultural Uses of Concrete

- A. Walks
- B. Driveways
- C. Floors
- D. Walls and foundations
- E. Culverts
- F. Steps
- G. Setting posts
- H. Compost pits

III. Advantages of Concrete

- A. Fire proof
- B. Durable and permanent
- C. Water tight
- D. Economical
- E. Termite and rodent proof
- F. Low maintenance
- G. Storm resistant
- H. Readily adapted

IV. Types and Uses of Portland Cement

- A. Type I - normal portland; sidewalks, floors, and bridges

# INFORMATION SHEET

- B. Type II - modified portland; lower heat of hydration; heavy, thick work.
- C. Type III - high, early, strength; used when high strengths are desired at very early periods (1-3 days); using during low temperatures.
- D. Type IV - low heat; used only in large masses; dams, etc.
- E. Type V - sulfate resistant; resists severe sulfate and alkali action.

## V. Ingredients Used in Concrete

- A. Cement
- B. Sand (fine aggregate)
- C. Gravel (coarse aggregate)
- D. Water - should be of drinking water quality, free of oil and impurities (NOTE: Sand and gravel are filler material to make concrete economical. They should be hard, rounded and clean).

## VI. Proportion of Materials in Concrete (TM 1)

Approximate volume of materials in concrete

Cement - 10%

Water - 15%

Sand and Gravel - 75%

## VII. Determining What a 1:2:3 Mixture of Concrete Is

- A. First digit equals parts of cement
- B. Second digit equals parts of sand
- C. Third digit equals parts of gravel

## VIII. Determining the Strength of Concrete

- A. Primarily determined by the amount of water added for each sack of cement (water-cement ratio).

  (NOTE: The proper amounts of water and cement should be established first and not altered. Aggregates should be altered to get a workable mixture).

- B. The amount of water in the sand must be considered when measuring the amount of water in the mixture (example: a five gallon mix should contain only five gallons water including the water in the sand).

  (NOTE: Recommended Mixtures:

  1. 5 gallon mix - for acid or alkaline resistant work or thin work
  2. 6 gallon mix - water tight and reinforced concrete
  3. 7 gallon mix - foundation walls and retaining walls)

## INFORMATION SHEET

IX. Measuring Moisture in Sand (TM 2)

- A. Hard press method (press sample into a ball)
- B. Damp sand (1/4 gallon water per cubic foot) ball of sand falls apart when hand is opened
- C. Wet sand - (1/2 gallon water per cubic foot) ball of sand holds its shape when hand is opened
- D. Very set sand (3/4 gallon water per cubic foot) ball formed, leaves hand wet.

X. Consistency of Mixture

- A. Controlled by addition or subtraction of aggregate.
- B. Consistency established by trial batches.

XI. Determining Amount of Materials Needed in Concrete (TM 3)

- A. Volume of raw material does not equal finished volume (the smaller particles fill in spaces between larger particles)
- B. Fuller's rule - mixing a total of 42 volumes of cement, sand, and gravel produces 27 volumes of concrete

XII. Mixing Concrete

- A. Machine mixing
  1. Determine mixer capacity
  2. Establish water-cement ratio for job (correct for sand moisture)
  3. Place measured amount of water in mixer
  4. Add part of gravel
  5. Add measured amount of cement
  6. Add sand and gravel to obtain desired consistency
  7. Mix for 2-3 minutes
- B. Hand mixing
  1. Establish water-cement ratio
  2. Place sand in mixing container
  3. Add cement and mix well with sand
  4. Add part of gravel
  5. Add water and mix
  6. Add sand and/or gravel for proper consistency

XIII. Ready-mixed Concrete

# INFORMATION SHEET

## XIII. Ready-mixed Concrete

A. Advantages

1. Convenient
2. Less hired labor needed
3. Quicker
4. In some cases more economical
5. Assured of good quality

B. Disadvantages

1. Cost may be high (mileage)
2. Forms must be stronger
3. Not always available when wanted
4. Sometimes large areas ready to finish at same time

## XIV. Preparing and Ordering Ready-mix

A. Determine water-cement ratio required for job

B. Determine bags of cement per cubic yard of concrete (range: from 5 - 7 bags)

C. Determine amount of concrete needed

D. Determine type of mix (1:2:3)

E. Call early and give (A-D) information and:

1. Time you want delivery
2. Specific direction to job site

F. Reconfirm your order early on day of delivery

G. Prepare site

1. Wet forms and subgrade 4 - 6 hours ahead of pouring concrete (keeps water in concrete)
2. Have forms well braced
3. Have equipment ready

## XV. Determining the Quality of Concrete Needed

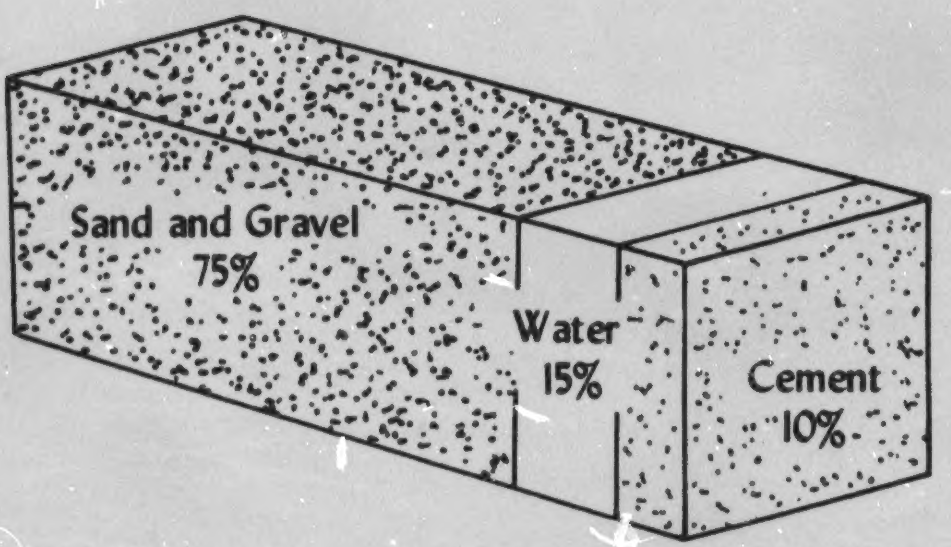
A. Determine the surface area (length x width)

B. Determine average depth of concrete

C. Determine cubic feet (length in feet x width in feet x thickness in inches.

D. Determine cubic yards (27 cubic feet in 1 cubic yard) = $\frac{\text{cubic feet}}{27}$

# VOLUME OF MATERIALS IN CONCRETE


Sand and Gravel
75%
Water
15%
Cement
10%

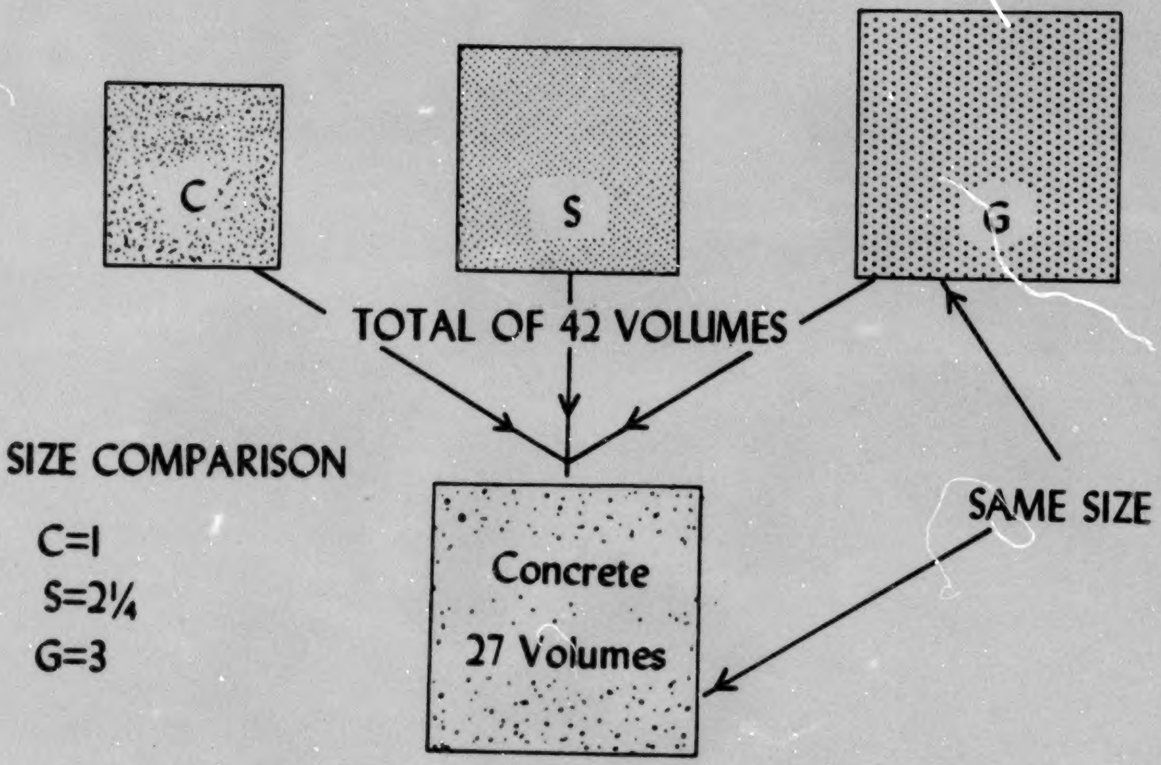
# MOISTURE IN SAND

| | | |
|---|---|---|
| Damp Sand | Falls Apart | ¼ gal. per cu. ft. |
| Wet Sand | Ball holds Shape | ½ gal. per cu. ft. |
| Very Wet Sand | Sparkles, wets hand | ¾ gal. per cu. ft. |

# RECOMMENDED MIXTURES

| Mix | Water (Gal.) per Sack Cement | | | Trial Batch | |
|---|---|---|---|---|---|
| | Sand | | | Cu. ft. Sand | Cu. ft. Gravel |
| | Damp | Wet | Very Wet | | |
| 5 Gallon | 4½ | 4 | 3¾ | 1¾ | 2 |
| 6 Gallon | 5½ | 4½ | 4 | 2¼ | 3 |
| 7 Gallon | 6¼ | 5½ | 4¾ | 2¾ | 4 |

# FULLER'S RULE


C
S
G
TOTAL OF 42 VOLUMES
SIZE COMPARISON
C=1
S=2¼
G=3
Concrete
27 Volumes
SAME SIZE

# MATERIALS FOR QUALITY CONCRETE

## UNIT 2

## ASSIGNMENT SHEET #1: Applying Fuller's Rule

Using a 6 gallon mix (1-2¼-3), how many sacks of cement and cubic yards of sand and gravel will be needed to build a sidewalk 4" thick, 6 feet wide, and 100 feet long.

A. Determine cubic feet of concrete

$$\frac{\text{Length x width x depth}}{12}$$ ________________________ cubic feet

B. Determine cubic feet of raw materials

$$\frac{\text{Cubic feet concrete x 42}}{27}$$ ________________________ cubic feet

C. Determine total volumes of mix

1 + 2¼ + 3 = ________________________

D. Determine sacks of cement

$$\frac{\text{Cubic feet of raw materials}}{\text{Total volumes of mix}} =$$ ________________________ sacks

E. Determine the cubic yards of sand

$$\frac{\text{Sacks of cement (sack contains 1 cubic foot) x sand proportion of mix (2.25)}}{27} =$$

________________________ cubic yards

F. Determine the cubic yards of gravel

$$\frac{\text{Sacks of cement x gravel proportion (3)}}{27} =$$ ______________ cubic yards

# MATERIALS FOR QUALITY CONCRETE

## UNIT 2

## ANSWERS TO ASSIGNMENT SHEET #1; Applying Fuller's Rule

A. $\frac{100 \times 6 \times 4}{12}$ = 200 cubic feet of concrete

B. $\frac{200 \times 42}{27}$ = 311 cubic feet of raw materials.

C. 1 + 2¼ + 3 = 6¼ parts

D. $\frac{311}{6.25}$ = 49.9 or 50 sacks

E. $\frac{50 \times 2.25}{27} = \frac{112.5}{27}$ = 4.17 cubic yards

F. $\frac{50 \times 3.0}{27} + \frac{150}{27}$ = 5.56 cubic yards

## MATERIALS FOR QUALITY CONCRETE

## UNIT 2

### Assignment Sheet #2: Determining Cubic Yards of Concrete for a Slab 200' x 20' x 4" deep

A. Determine surface area - Length ______________, width ______________

B. Determine average depth ______________.

C. Determine cubic feet

$$\frac{\text{Length x width x thickness}}{12} = \_\_\_\_\_\_\_\_\_\_\_\_\_\_$$

D. Determine cubic yard

$$\frac{\text{Cubic feet}}{27} = \_\_\_\_\_\_\_\_\_\_\_\_\_\_$$

(NOTE: 27 cubic feet = 1 cubic yard)

## MATERIALS FOR QUALITY CONCRETE

## UNIT 2

## ANSWERS TO ASSIGNMENT SHEET #2: Determining Cubic Yards

A. Length 200'  Width 20'

B. Depth 4"

C. $\frac{200 \times 20 \times 4''}{12}$ = 1,333.33 cubic feet

D. $\frac{1333.34}{27}$ = 49.38 cubic yards or 49 1/2 yards

# MATERIALS FOR QUALITY CONCRETE

## UNIT 2

## JOB SHEET #1. Mixing a Trial Batch of Concrete

I. Tools and Equipment Needed.

- A. Cement mixer or mixing trough
- B. Hoe
- C. Water Hose
- D. Flagstone forms
- E. Gallon cans (2)

II. Materials Needed.

- A. Cement
- B. Sand
- C. Gravel (aggregate)
- D. Water

III. Procedure for Using Cement Mixer.

- A. Determine the ratio of cement-sand-gravel. (Determined by desired strength)
- B. Determine moisture content of sand
  - 1. Damp sand - (¼ gallon water per cubic foot) ball of sand falls apart when hand is opened.
  - 2. Wet sand - (½ gallon water per cubic foot) ball of sand holds its shape.
  - 3. Very Wet Sand - (3/4 gallon water per cubic foot) ball formed, leaves hand wet.
- C. Determine mixer capacity.
- D. Establish water-cement ratio for job (correct for sand moisture.)
- E. Place desired amount of water in mixer.
- F. Add part of gravel.
- G. Add measured amount of cement.
- H. Add sand and gravel to obtain desired consistency.
- I. Mix for 2-3 minutes.

IIIB. Procedure for Using Mixing Trough.

- A. Determine cement - sand - gravel ratio.
- B. Establish water cement ratio (correct for sand moisture).
- C. Place sand in mixing trough.
- D. Add cement and mix well with sand.

JOBSHEET #1: Mixing a Trial Batch of Concrete.

E. Add gravel and mix.

F. Add water and mix.

G. Add sand and/or gravel for proper consistency.

(Place, finish, and cure concrete according to next Unit)

(NOTE: Cement (dry) has properties which remove moisture from your skin, so avoid prolonged contact.)

# MATERIALS FOR QUALITY CONCRETE

## UNIT 2

## TEST

1. Match the following concrete terms with the definition.

_____a. Concrete
_____b. Cement
_____c. Sand
_____d. Gravel
_____e. Fuller's Rule
_____f. Water-Cement Ratio

1. Ratio of water to cement.
2. Manufactured product of lime, iron oxide, silica, and alumina.
3. Aggregates ranging from 1/4" to 1 1/2" in size.
4. Aggregates ranging from very fine to 1/4" in diameter.
5. Mixing a total of 42 volumes of cement, sand and gravel will produce 27 volumes of concrete.
6. Mixture of a paste of cement and water, binding fine and coarse aggregate into a rock-like moss.

2. List six uses of concrete in agriculture.

3. List five advantages of concrete construction.

4. Match the porland cement types with the correct characteristic.

_____a. Type I Portland
_____b. Type II Portland
_____c. Type III Portland
_____d. Type IV Portland
_____e. Type V Portland

1. Normal portland
2. Modified portland - lower hydration heat
3. Sulfate resistant type
4. Used in massive structures, dams, etc.
5. High early strength type.

5. List the four ingredients of concrete.

6. Write the approximate volume each of the following constitute of a concrete batch.

Cement ____________%
Water ____________%
Sand and Gravel __________%

7. Describe (by volume) what a 1:2:3 mixture would be.

## TEST

8. Identify from the following list what primarily determines the strength of concrete by circling appropriate letter.

   a. Water cement ratio.

   b. Breaking strength of aggregate.

   c. Amount of rock added.

9. Complete the following table on moisture in sand.

| | | |
|---|---|---|
| a. ________ | sand-ball holds shape | 1/2 gallon per cubic foot |
| b. ________ | sand-ball falls apart | 1/4 gallon per cubic foot |
| c. ________ | sand-sparkles, wets hand | 3/4 gallon per cubic foot |

(1) Dry (2) Wet (3) Damp (4) Very wet

10. Describe how the consistency of concrete should be altered.

11. State Fullers rule as it applies to concrete.

12. Place in order the steps of hand mixing and machine mixing. (Place 1 for first 2 for second, etc.)

| Hand Mixing | | Machine Mixing | |
|---|---|---|---|
| ____a. | Add gravel and mix. | ____a. | Add sand and gravel for consistency. |
| ____b. | Add cement and mix with sand. | ____b. | Determine mixer capacity. |
| ____c. | Establish water-cement ratio. | ____c. | Mix 2-3 minutes |
| ____d. | Place sand in mixing container. | ____d. | Add part of gravel. |
| ____e. | Add water and mix. | ____e. | Establish water-cement ratio |
| ____f. | Add sand and gravel for proper consistency. | ____f. | Place measured amount of water in mixer. |
| | | ____g. | Add measured amount of cement. |

13. List three advantages and three disadvantages of ready-mixed concrete.

| Advantages | Disadvantages |
|---|---|
| 1. | 1. |
| 2. | 2. |
| 3. | 3. |

14. Describe how to prepare for, and order ready-mix concrete.

| Preparing for | Ordering |
|---|---|
| 1. | 1. |
| 2. | 2. |
| 3. | 3. |

# MATERIALS FOR QUALITY CONCRETE

## UNIT 2

## ANSWERS TO TEST

1. a. 6
   b. 2
   c. 4
   d. 3
   e. 5
   f. 1

2. Any six of the following:
   Fence posts
   Water troughs
   Walks
   Drive-ways
   Floors
   Feeding troughs
   Steps
   Cattle guards
   Walls and foundations
   Septic tanks
   Feeding floors
   Culverts
   Manure pits
   Silos
   Setting posts

3. Any five of the following:
   Fireproof
   Durable and permanent
   Water tight
   Economical
   Readily adapted
   Termite and rodent proof
   Low maintenance
   Storm resistant

4. a. 1
   b. 2
   c. 5
   d. 4
   e. 3

5. a. Water
   b. Sand (fine aggregate)
   c. Gravel (coarse)
   d. Water

## ANSWERS TO TEST

6. Cement - 10%
   Water - 15%
   Sand and Gravel - 75%

7. 1. Parts of cement
   2. Parts of sand
   3. Parts of gravel

8. a. Water-cement ratio

9. a. 2
   b. 3
   c. 4

10. Controlled by addition or subtraction of aggregate.

11. Mixing a total of 42 volumes of cement, sand, and gravel produces 27 volumes of concrete.

12.

| | | | |
|---|---|---|---|
| a. | 4 | a. | 6 |
| b. | 3 | b. | 1 |
| c. | 1 | c. | 7 |
| d. | 2 | d. | 4 |
| e. | 5 | e. | 2 |
| f. | 6 | f. | 3 |
| | | g. | 5 |

13. Advantages (any three)
    1. Convenient
    2. Less hired labor
    3. Quicker
    4. Assured of good quality
    5. May be more economical

    Disadvantages (any three)
    1. Cost may be high
    2. Forms must be strong
    3. Not always available
    4. Sometimes large areas ready to finish at same time

## ANSWERS TO TEST

14. Ready-mix (ordering)
    1. Establish water-cement ratio for job.
    2. Establish bags of cement per yard of cement.
    3. Determine amount of concrete needed.
    4. Determine type of mix.
    5. Call early and list (1-4), time of delivery, and directions to job site.
    6. Reconfirm order on day of delivery

    Ready-mix (preparing for)
    1. Wet forms and subgrade 4-6 hours before pouring concrete.
    2. Have forms well braced.
    3. Have equipment ready.

# HORTICULTURE MECHANICS

## UNIT 3

## PLACING, FINISHING, AND CURING CONCRETE

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to match a list of terms with the definitions dealing with placing, finishing, and curing concrete. They will be able to name the procedures involved in placing concrete and to list the steps used in finishing concrete. The student will be able to describe the various types of finishes, their uses, and how they are obtained, and to name the processes used in properly curing concrete. This objective will be considered achieved by scoring at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Match terms dealing with placing, finishing, and curing concrete with the proper definitions.
2. Name five procedures used in properly placing conrete.
3. Name five procedures that are used in finishing concrete.
4. Name the various types of concrete finishes, their uses, and how they are obtained.
5. Name two procedures used in properly curing concrete.
6. Name the three factors which proper concrete curing improves.
7. List two common methods of curing concrete.

# HORTICULTURE MECHANICS

## UNIT 1

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide each student with Information Sheet
3. Make Transparencies
4. Discuss Terminal and Specific Objectives with students
5. Discuss Information Sheets
6. Give Test

Students:

1. Read Objectives
2. Study Information Sheet
3. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Transparency Masters
   TM 1 - Screeding and Metal Trowel
   TM 2 - Edging and Jointing
   TM 3 - Types of Finish
4. Test
5. Answers to Test

References:

1. Agricultural Education Teaching Materials Center, Texas A & M, College Station, Texas, V C-3, Basic Voc Ag II.
2. Quality Concrete, Hobar Publications, 1305 Tiller Lane, St. Paul, Minnesota. 55112
3. Making Quality Concrete for Farm Construction, #PA055T, Portland Cement Association, Old Orchard Rd., Skokie Illinois. 60076

# HORTICULTURE MECHANICS

## UNIT 3

## INFORMATION SHEET

I. Terms and Definitions

A. Screeding - Removing the excessive concrete from the form.

B. Edging - Rounding the edges to prevent chipping or damage to the edge of the concrete.

C. Floating - Pushing the larger aggregates down away from the surface and bringing mortar to the surface.

D. Curing - Plenty of moisture is present to obtain maximum hydration of the cement.

E. Scaling - When surface breaks away from the slab.

F. Crazing - Fine hair cracks on surface of concrete.

G. Dusting - powdery material on surface of concrete.

H. Jointer - To create a groove across concrete to control cracking.

II. Placing Procedures

A. Place concrete in forms as soon as possible after making. It will begin to set within 30 to 45 minutes.

B. Place concrete where it is needed. Do not drag or allow it to flow.

C. Place in even layers about 6 to 8 inches deep and tamp well.

D. In slab construction, start at the point farthest away from you, so the next batch will be placed against it to prevent segregation.

E. Avoid dumping concrete against side of forms.

F. Avoid letting the chute or buggy hit the side of the forms.

G. Tamp and spade the concrete mixture thoroughly to prevent air pockets.

H. Work the mixture against the side of the forms so the large aggregates will be forced away from the forms for a smooth surface.

I. In all cases, procedures should be carried out to prevent water from collecting at the ends and corners of the forms.

III. Finishing Concrete (TM 1 and 2)

A. Concrete should be screeded as soon as it has been tamped or spaded in the forms..

B. Finishing should be delayed until the surface is quite stiff but still workable.

C. Surface water should be allowed to evaporate.

D. Dry cement should not be sprinkled on top to remove moisture for finishing purposes, as this material will form a layer that is likely to develop hair line cracks.

## INFORMATION SHEET

E. Edging and jointing follow the screeding operation

F. After the concrete is edged and jointed, it should be floated

G. Trowel the concrete to bring a thick film of cement to the top which results in a smooth level finish

IV. Types of Concrete Finishes (TM 3).

| | Type | Use | Obtained By |
|---|---|---|---|
| A. | Gritty, non-slipping | Walks, dairy barn floors | Using wood float |
| B. | Coarse, scored surface | Driveways, lots, ramps, floors | Using a stiff trowel |
| C. | Smooth troweled finish | Table tops, feed troughs | Using steel trowel |
| D. | Pea grain | Porches and patios | Washing with water hose |

V. Curing Concrete

A. Curing should be started as early as possible and continued for at least seven days

B. Moisture curing greatly increases the strength of the concrete

VI. Factors Improved by Proper Concrete Curing

A. Strength

B. Durability

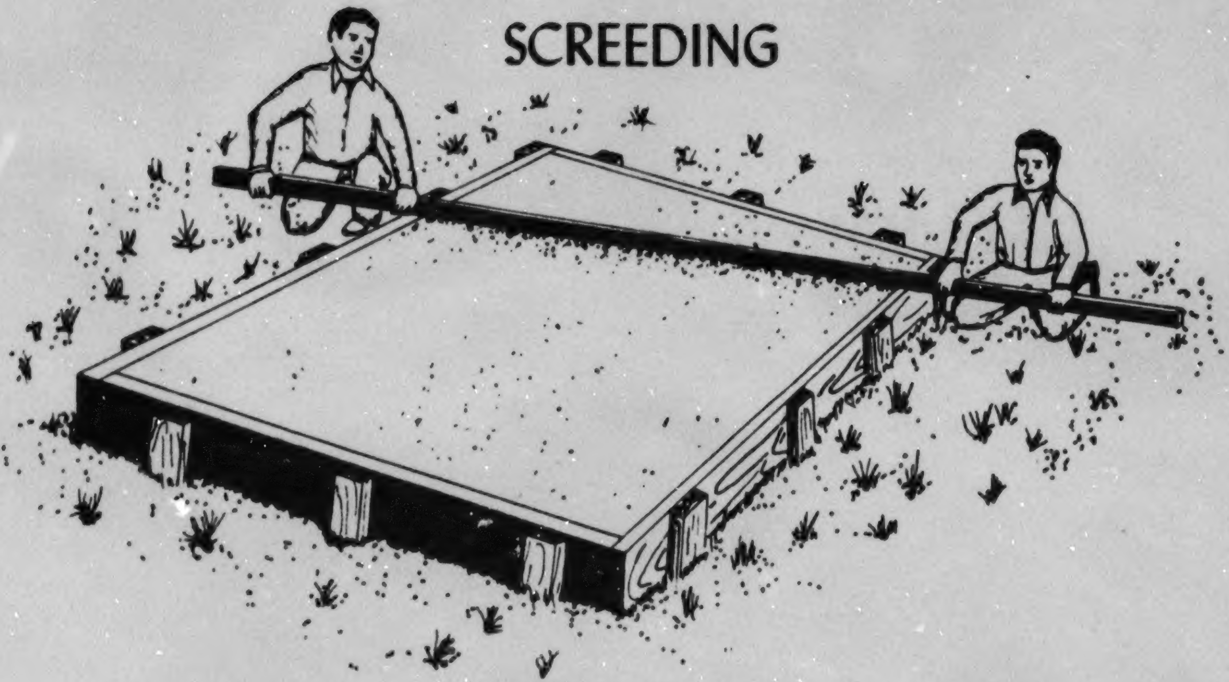
C. Watertightness

VII. The Common Methods of Curing Concrete

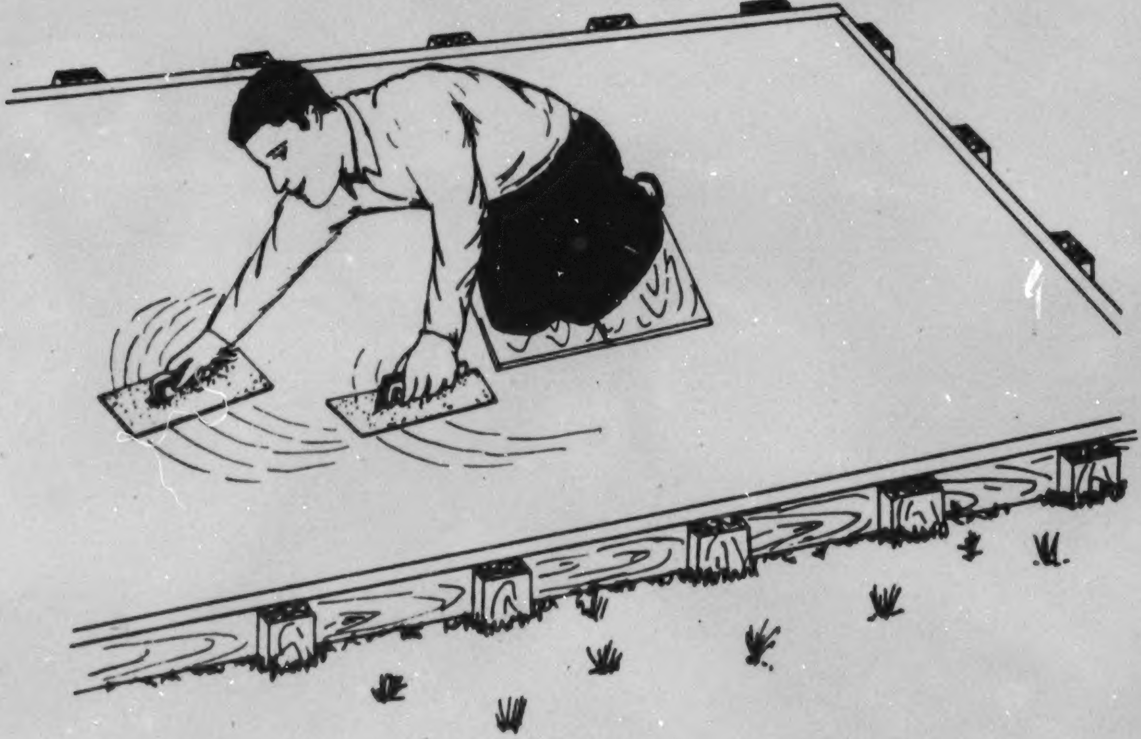
A. Cover with straw, sand, wet burlap, or canvas as soon as possible without marring surface. Keep this covering constantly wet during the curing process.

B. Flood the surface and hold the water on the surface with some type of border around the edge of slab.

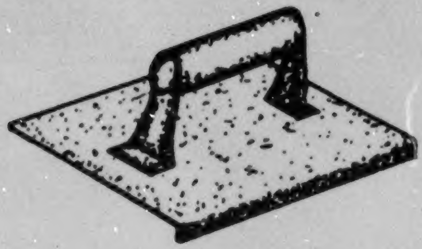
## SCREEDING

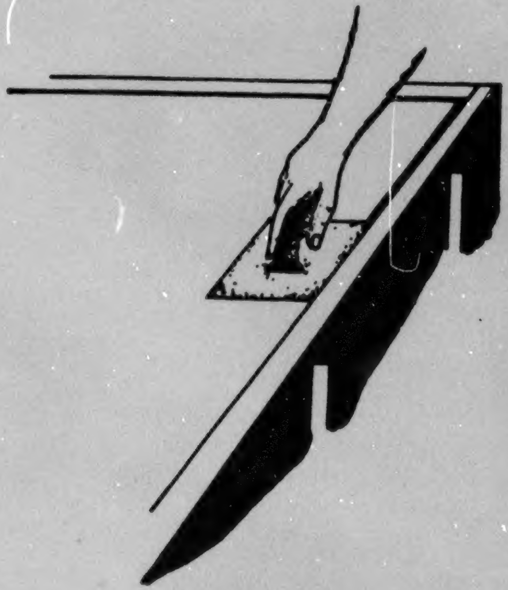


## METAL TROWEL

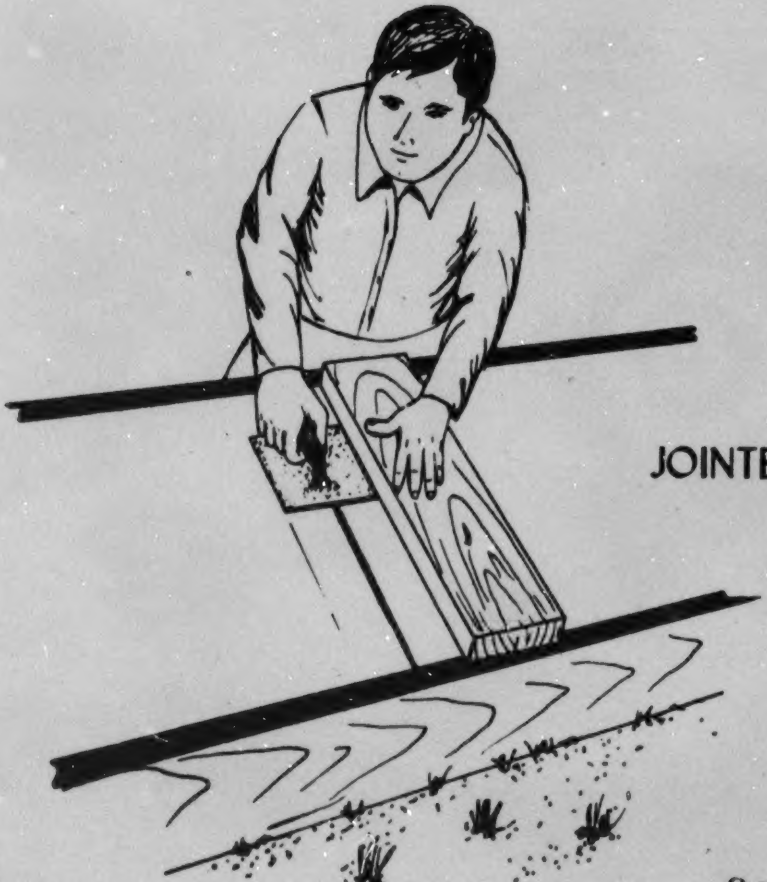


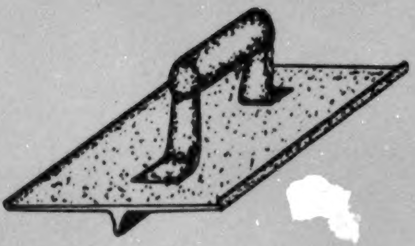
# EDGING AND JOINTING





EDGER





JOINTER

# TYPES OF FINISH

| SURFACE | USE | OBTAINED BY |
|---|---|---|
| Gritty, non-slipping | Walks, dairy barn floors, etc. | Using wood float |
| Coarse, scored | Driveways, feeding floors, ramps | Using stiff broom |
| Smooth finish | Table tops, feed troughs | Using steel trowel |
| Pea grain | Porches, walks, patios | Washing with water hose |

HORTIII SH U3-8

# HORTICULTURE MECHANICS

## UNIT 3

1. Match terms with the proper definitions.

_____a. Crazing
_____b. Curing
_____c. Edging
_____d. Screeding
_____e. Floating
_____f. Dusting
_____g. Scaling
_____h. Jointer

1. Removing the excessive concrete from the forms.
2. Rounding the edges to prevent chipping or damage to the edge of the concrete.
3. Pushing the larger aggregates down away from the surface and bringing mortar to the surface.
4. Plenty of moisture is present to obtain maximum hydration of the cement.
5. When surface breaks away from the slab.
6. Fine hair cracks on surface of concrete.
7. Powdery material on surface of concrete.
8. To create a groove across concrete to control cracking.

2. Name five of the procedures used in properly placing concrete.

3. Name five procedures that are used in finishing concrete.

4. Name four types of concrete finishes, their uses, and how they are obtained.

5. Name two methods used in properly curing concrete.

6. Name the three factors which proper concrete curing improves.

7. List two common methods of curing concrete.

## HORTICULTURE MECHANICS

## UNIT 3

## ANSWERS TO TEST

1. a. 6
   b. 4
   c. 2
   d. 1
   e. 3
   f. 7
   g. 5
   h. 8

2. Any five of the following:
   a. Place concrete in forms as soon as possible after mixing.
   b. Place concrete where it is needed.
   c. Place in even layers about 6 to 8 inches deep and tamp well.
   d. In slab construction, start at the point farthest away from you, so the next batch will be placed against it to prevent segregation.
   e. Avoid dumping concrete against side of forms.
   f. Avoid letting the chute or buggy hit the sides of the forms.
   g. Tamp and spade the concrete mixture thoroughly to prevent air pockets.
   h. Work the mixture against the side of the forms so the large aggregates will be forced away from the forms for a smooth surface.
   i. In all cases, procedures should be carried out to prevent water from collecting at the ends and corners of the forms.

3. Any five of the following:
   a. Concrete should be screeded as soon as it has been tamped or spaded in the forms.
   b. Finishing should be delayed until the surface is quite stiff but still workable.
   c. Surface water should be allowed to evaporate.
   d. Dry cement should not be sprinkled on top to remove moisture for finishing purposes, as this material will form a layer that is likely to devèlop hair line cracks.
   e. Edging and jointing follow the screeding operation.
   f. After the concrete is edged and jointed it should be floated.
   g. Trowel the concrete to bring a thick film of cement to the top.

## ANSWERS TO TEST

4.

|  | Type | Use | Obtained By |
|---|---|---|---|
| a. | Gritty, non-slipping | Walks, dairy barn floors | Using wood float |
| b. | Coarse, scored surface | Driveways, lots, ramps, floors | Using a stiff broom |
| c. | Smooth, troweled finish | Table tops, feed troughs | Using steel trowel |
| d. | Pea grain | Porches and patios | Washing with water hose |

5. a. Curing should be started as early as possible and continued for at least seven days.

   b. Moisture curing greatly increases the strength of the concrete.

6. a. Strength

   b. Durability

   c. Watertightness

7. a. Cover with straw, sand, wet burlap, or canvas as soon as possible without marring surface.

   b. Flood the surface and hold the water on the surface with some type of border around the edge of slab.

# HORTICULTURE MECHANICS

## UNIT 4

## FUNDAMENTALS OF ELECTRICITY

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to define common electrical terms that are necessary to identify the behavior of electricity and the rules that it follows. They should be able to calculate the cost of electricity and distinguish between a 115-volt and a 230-volt circuit. They should be able to identify various means by which electricity is transported from generator to the farm. This knowledge will be evidenced by scoring at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Define ten terms associated with electricity.
2. Neme six benefits derived from the use of electricity.
3. Discuss the electron theory.
4. Name the two sources of farm electricity.
5. Name the four means of transporting electricity.
6. Distinguish between a 115-volt service and a 230-volt service.
7. Name the two types of power suppliers.
8. Name the power supplier that services the area.
9. Define Ohm's law as related to electricity.
10. Name the three types of electrical rates.
11. List the two types of kilowatt-hour electric meters.
12. Read an electrical meter and calculate the kilowatt-hours using the residential rate. (Assignment Sheet #1)
13. Calculate the kilowatt-hours for a given number of hours. (Assignment Sheet #2)
14. Calculate problems determining volts, watts, and amps. (Assignment Sheet #3)

## HORTICULTURE MECHANICS

## UNIT 4

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information and Assignment Sheets
3. Make transparencies
4. Discuss Terminal and Specific Objectives with students.
5. Discuss Information and Assignment Sheets with students
6. Show film "Electricity for Beginners." (Order from Curriculum and Instructional Materials Center, Stillwater, Oklahoma)
7. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Complete Assignment Sheets and turn in to instructor
4. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Transparency Masters
    - TM 1 - Electrical Transporting Lines
    - TM 2 & 3 - Ohm's Law
    - TM 4 - Pointer-Dial Electric Meter
    - TM 5 - Cyclometer Electric Meter
4. Assignment Sheets
    - #1 - Calculate Residential Electric Rates
    - #2 - Calculate Cost of Operating Electrical Equipment
    - #3 - Calculate Volts, Watts, and Amps
5. Answers to Assignment Sheets
6. Test
7. Answers to Test

## SUGGESTED ACTIVITIES

References:

1. Maintaining the Lighting and Wiring System, American Association for Vocational Instructional Materials, Athens, Georgia, 1974.
2. Marcus, Abraham, Basic Electricity, Prentice Hall, Englewood, New Jersey, 1974.
3. Shop Planning, Basic Design of Shop and Service Center, American Association for Vocational Instructional Materials, Athens, Georgia, 1975.
4. Understanding Electricity and Electrical Terms, American Association for Vocational Instructional Materials, Athens, Georgia, 1975.

## HORTICULTURE MECHANICS

## UNIT 4

## INFORMATION SHEET

I. Terms and Definitions

- A. Electricity - A source of energy that can be easily converted into light, heat, or power.
- B. Ampere (Amp) - A unit of measure of the rate of flow of electricity through a wire.
- C. Volt - A unit of measure of electrical pressure.
- D. Watt - A unit of measure used in determining the rate of energy supplied.
- E. Watt-hour - One watt for one hour.
- F. Kilowatt (KW) - 1,000 watts.
- G. Kilowatt-hour - The reference indicating the use of 1,000 watts of electricity for one hour.
- H. Horsepower (hp) - A unit of mechanical power which is equal to 746 watts of electrical power.
- I. Direct current - (DC) - The term meaning that the current flows in one direction at a continuous rate.
- J. Alternating current (AC) - The term meaning that the current reverses at regular intervals.
- K. Circuit - A complete path, through which electricity flows, such as from the power source to a lamp, through the lamp, and back to the power source.
- L. Switch - A device used to open or close a circuit.
- M. Fuse - A safety device which burns out when the current becomes too great.

  (NOTE: A fuse must be replaced when blown)
- N. Circuit breaker - A safety device which opens the circuit by tripping a switch rather than burning out.

  (NOTE: A circuit breaker can be reset after time allowed for cooling)
- O. Conductors - The wires which carry the electricity, or through which electricity flows.
- P. Insulation - A protective covering over wires to prevent completing a circuit except where desired.
- Q. Hot wires - The current carrying conductors with electrical pressure on them (usually black or red), connected to fuse or circuit breaker at distribution panel.
- R. Neutral wires - The current carrying conductors with no pressure on them (usually white), connected to neutral base at the distribution panel.

## INFORMATION SHEET

S. Grounding - The connection of the neutral part of the electrical system to the earth to reduce the possibility of damage from lightning, and the connection of the housings of electrical equipment to the earth to minimize the danger of electrical shock.

T. Short circuit - An improper connection between hot and neutral wires or between hot wires.

U. Voltage drop - A loss in electrical pressure from its source to its point of use.

V. U. L. (Underwriter's Laboratories) - A nationally accepted organization which tests all types of wiring materials and devices to make certain they meet minimum standards for safety and quality.

W. Service transformer - An alternating current device used to change voltage from primary to secondary, such as: from 6,900 volts primary to 115 volts or 230 volts secondary; or from 115 volts primary to 230 volts secondary.

X. Single phase - A type of electric service available to most farms requiring one transformer between power supplier and customer.

Y. Three phase - A type of electric service providing three independent AC currents which reach peak voltage at different times.

Z. Meter - An instrument which records the amount of electrical energy used (kilowatt-hours).

AA. Resistance - The property of a substance that opposes the flow of current (ohms).

II. Benefits of Using Electricity

A. Light

B. Power

C. Heat

D. Cooling

E. Communications

F. Special controls

III. Electron Theory

A. Electrons - Ones having a negative charge

B. Protons - Ones having a positive charge

C. Negative electrons - Ones which move freely

(NOTE: Negative electrons circulate about positive protons which form the nucleus of the atoms.)

## INFORMATION SHEET

IV. Sources of Farm Electricity

  A. Individual plant

  B. Central station and distribution lines (power generally purchased).

V. Means of Transporting Electricity (TM 1)

  A. Transmission lines - The lines extend from generating station to substation or from substation to substation.

  B. Distribution lines - The lines beginning at a substation and extending out over the countryside, usually ranging from three to fifteen miles.

  C. Service drop lines - The lines that run from a distribution line to the meter pole.

  D. Feeder lines - The lines that run from the meter pole to the house.

VI. Differences Between 115-Volt Service and 230-Volt Service

  A. 115-volt service - Two lines running to the house.

  B. 230-volt service - Three lines running to the house.

VII. Types of Power Suppliers

  A. REA Cooperatives

  B. Public or private companies

VIII. Local Power Supplier

  A.

  B.

IX. Ohm's Law - All electric circuits have a definite relationship between the the pressure, the electron motion, and the opposition to electron flow (TM 2 & 3).

  A. Voltage - current x resistance

  B. Voltage - E volts

  C. Current - I amps

  D. Resistance - R ohms

X. Electrical Rates

  A. Residential

  B. Commercial

  C. Special

## INFORMATION SHEET

D. Example of calculating residential rates:

1. First 20 kwhs at 7¢ per kwh
2. Next 20 kwhs at 5¢ per kwh
3. Next 60 kwhs at 3¢ per kwh
4. Next 120 kwhs at 2½¢ per kwh
5. Over 220 kwhs at 1¢ per kwh

E. Customer used 300 kwhs

| | |
|---|---|
| 1. First 20 kwhs at 7¢ | $1.40 |
| 2. Next 20 kwhs at 5¢ | 1.00 |
| 3. Next 60 kwhs at 3¢ | 1.80 |
| 4. Next 120 kwhs at 2½¢ | 3.00 |
| 5. Next 80 kwhs at 1¢ | .80 |
| 6. Total cost of 300 kwhs | $8.00 |

XI. Types of Kilowatt-Hour Meters (TM 4)

A. Cyclometer

B. Pointer-dial

XII. Cost of Operating Electrical Equipment

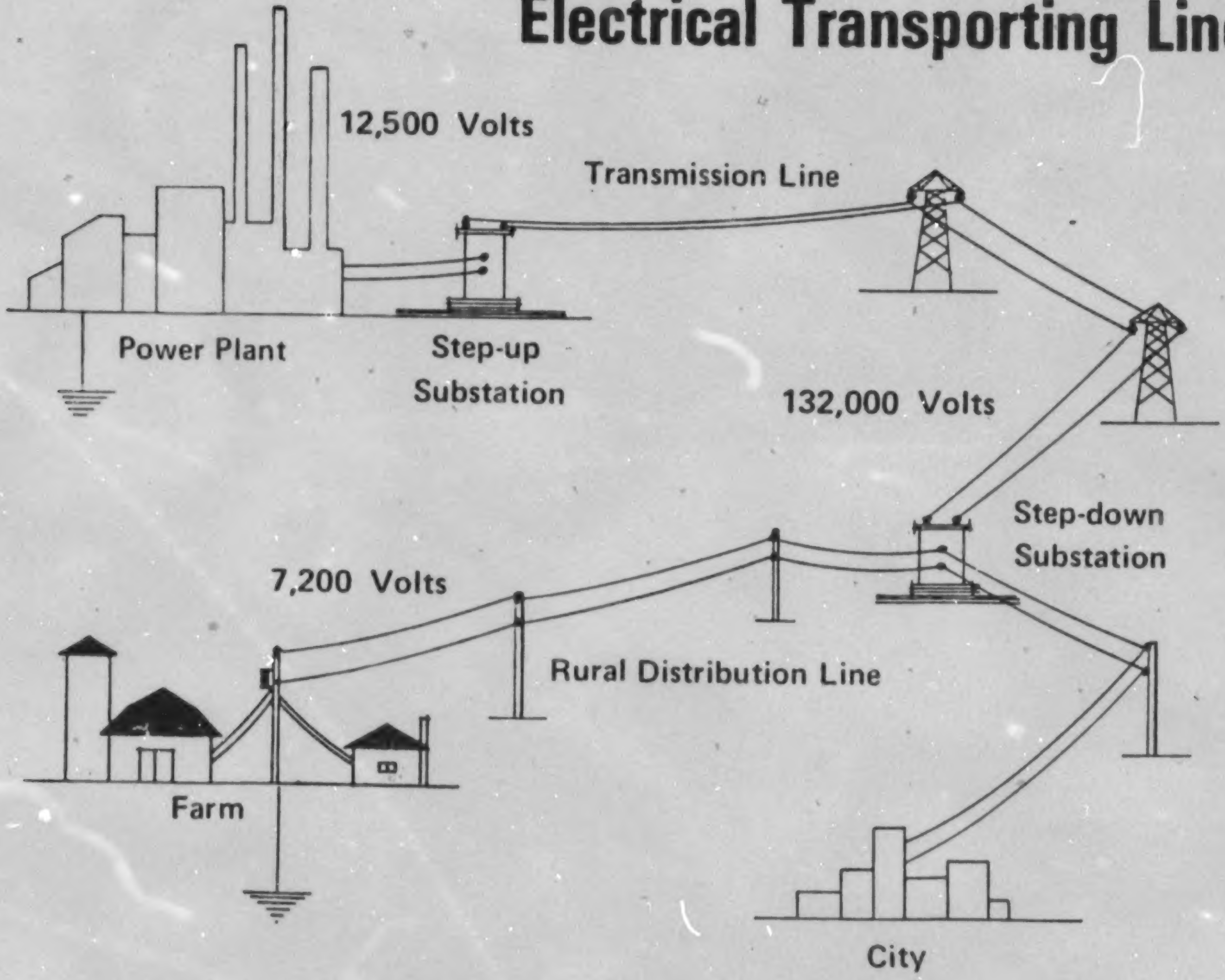
A. Watts x hours of operation = Watt-hours

B. Kilowatt-hours (kwhr) = $\frac{\text{Watts x Hours}}{1000}$

C. Motors

1. Multiply 1,200 by hp rating if motor is smaller than one-half hp.
2. Multiply 1,000 by hp rating if motor is one-half hp or greater
3. Example:
    a. 1/4 hp motor x 1,200 = 300 watts
    b. 300 watts x 2 hours of operation = 600 watt-hours
    c. $\frac{600}{1000}$ = .6 kwhr

# Electrical Transporting Lines


12,500 Volts
Transmission Line
Power Plant
Step-up Substation
132,000 Volts
Step-down Substation
7,200 Volts
Rural Distribution Line
Farm
City

# OHM'S Law

$$I = \frac{E}{R}$$

$$\text{Amperes} = \frac{\text{Volts}}{\text{OHMS}}$$

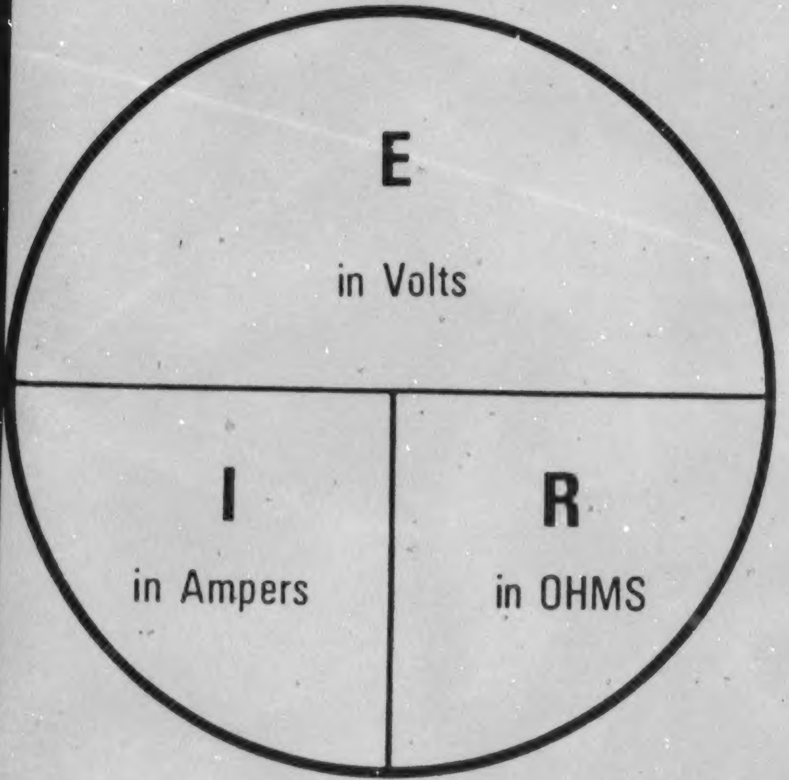
$$E = IR$$

$$\text{Volts} = \text{Amperes} \times \text{OHMS}$$

$$R = \frac{E}{I}$$

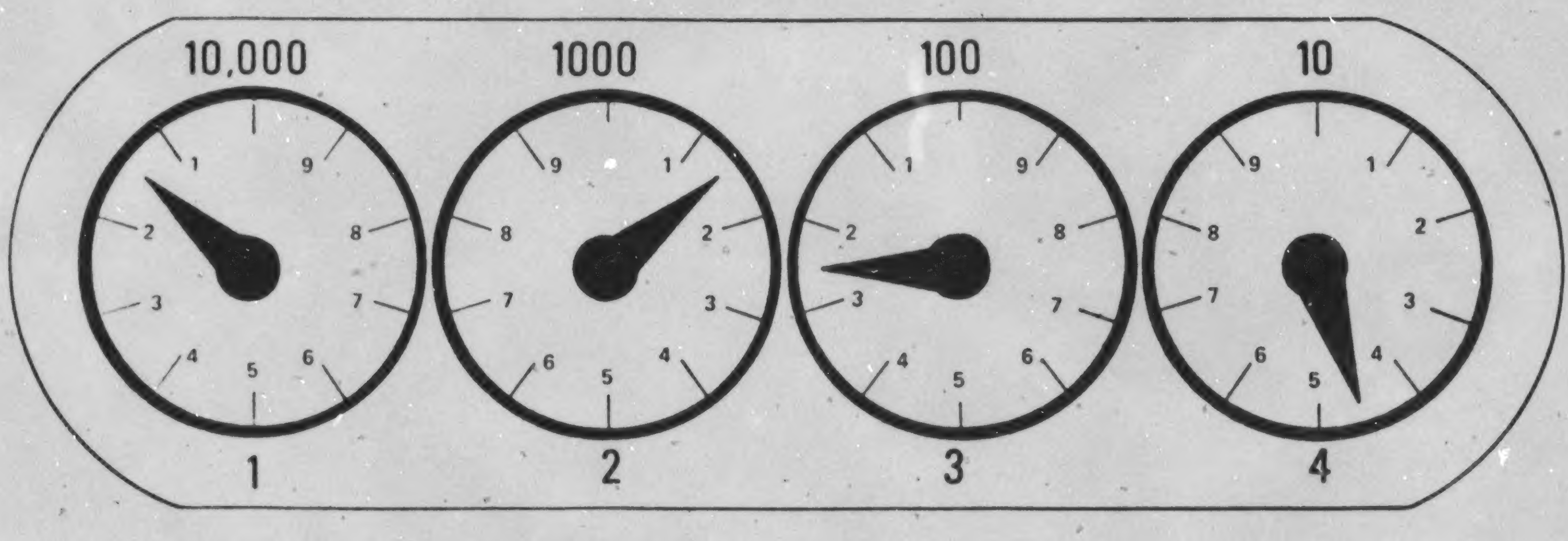
$$\text{OHMS} = \frac{\text{Volts}}{\text{Amperes}}$$

# OHM'S Law


E
in Volts
I
in Ampers
R
in OHMS

HORTIII SH U4-10

# Pointer-Dial Electric Meter

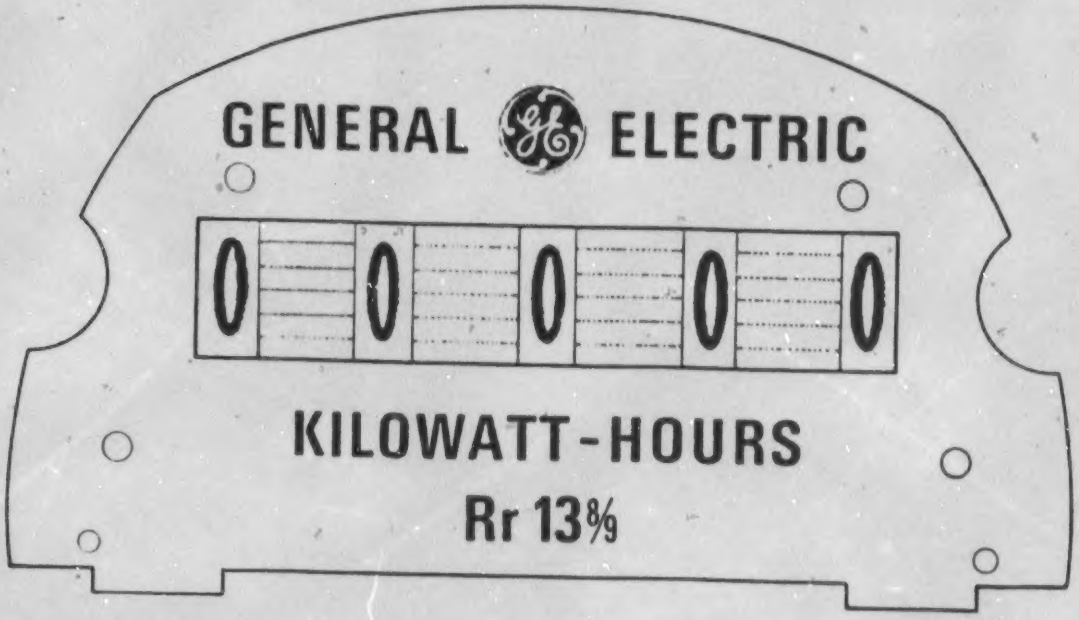


Read the last figure passed by the hand. When the hand seems to be on the number, the dial to the right should be consulted to see whether or not the number has been passed. Dial 4 shows the number of tenths. Dial 3 shows the number of one-hundredths. Dial 2 shows the number of one-thousandths.

HORTIII SH U4-11

TM 4

# Cyclometer Electric Meter


GENERAL ELECTRIC
0 0 0 0 0
KILOWATT-HOURS
Rr 13 8/9

# HORTICULTURE MECHANICS

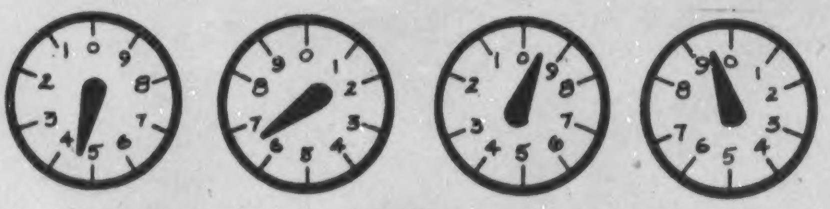
## UNIT 4

## ASSIGNMENT SHEET #1: Calculate Residential Electric Rates.

Work each of the problems below showing your work. Read the example of the electric kilowatt-hour meters, subtract the previous reading, and calculate the electric bill. Each problem should be figured using the rate listed below.

First 20 kwhs at 7¢ per kwh
Next 20 kwhs at 5¢ per kwh
Next 60 kwhs at 3¢ per kwh
Next 120 kwhs at 2½¢ per kwh
Over 220 kwhs at 1¢ per kwh

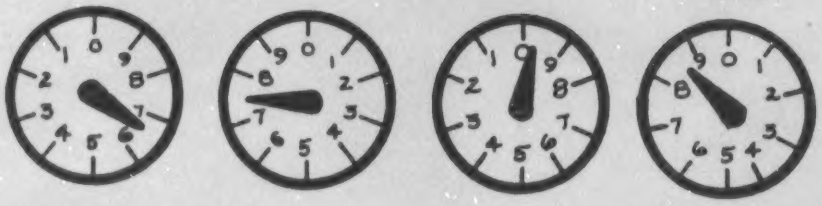
Meter A



Reading____________

Previous reading 4459

Meter B

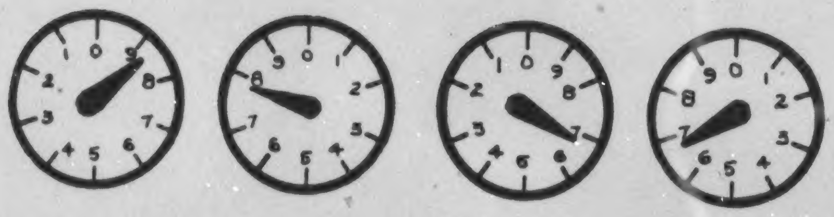


Reading_____________

Previous reading 5680

## ASSIGNMENT SHEET #1: Calculate Residential Electric Rates.

Meter C


1
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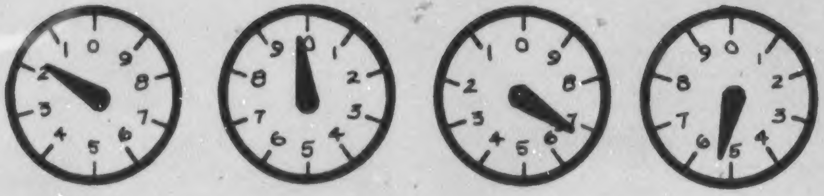
4

Reading____________

Previous reading 8450

Meter D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7
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6
5
4

Reading___________

Previous reading 1000

## HORTICULTURE MECHANICS

### UNIT 4

### ASSIGNMENT SHEET #2: Calculate Cost of Operating Electrical Equipment

Work each of the problems listed below. All problems should be worked using the average cost of 2¢ per kwh for electricity. Be sure to show your work.

1. How much would it cost to operate a 1/4-hp motor for 12 hours?

2. How much would it cost to operate a 2-hp motor for 10 hours?

3. How much would it cost to operate a 100-watt light bulb for a period of 12 hours?

4. An electric refrigerator requires 150 watts of electric power. It operates an average of four hours each day. How many kilowatt-hours would be used in 30 days, and how much would it cost for operation?

5. What would be the cost of operating a heat lamp that pulls 200 watts for 5 hours?

# HORTICULTURE MECHANICS

## UNIT 4

## ASSIGNMENT SHEET #3: Calculate Volts, Watts, and Amps.

Work each of the problems below. When you have finished working the problems, turn in to the instructor.

1. Calculate ohms when:
   a. Amps - 4 and volts - 230 ______________________
   b. Amps -15 and volts - 115 ______________________
   c. Amps - 8 and volts - 120 ______________________

2. Calculate volts when:
   a. Amps - 12.5 and ohms - 9.6 ______________________
   b. Amps - 6 and ohms - 19 ______________________
   c. Amps - 3 and ohms - 80 ______________________

3. Calculate amps when:
   a. Volts - 125 and ohms - 11 ______________________
   b. Volts - 240 and ohms - 11 ______________________
   c. Volts - 120 and ohms - 60 ______________________

# HORTICULTURE MECHANICS

## UNIT 4

## ANSWERS TO ASSIGNMENT SHEETS

A. Assignment Sheet #1:

| | | |
|---|---|---|
| Meter A | Reading | 4699 |
| | Previous reading | 4459 |
| Bill price $7.40 | | 240 kwh |
| Meter B | Reading | 6798 |
| | Previous reading | 5680 |
| Bill price $16.18 | | 1118 kwh |
| Meter C | Reading | 8766 |
| | Previous reading | 8450 |
| Bill price $8.16 | | 316 kwh |
| Meter D | Reading | 1965 |
| | Previous reading | 1000 |
| Bill price $14.65 | | 965 kwh |

B. Assignment Sheet #2:

1. 7.2¢
2. 40¢
3. 2.4¢
4. 36¢
5. 2¢

C. Assignment Sheet #3

1. a. 57.5
   b. 7.67
   c. 15.0
2. a. 120.0
   b. 114.0
   c. 240.0
3. a. 11.36
   b. 21.81
   c. 2.0

# HORTICULTURE MECHANICS

## UNIT 4

## TEST

1. Define the following terms.
   - a. Volt
   - b. Switch
   - c. Conductor
   - d. Voltage drop
   - e. Meter
   - f. Resistance
   - g. Kilowatt
   - h. Watt
   - i. Electricity
   - j. Amp

2. Name six benefits derived from the use of electricity.

3. Discuss the electron theory.

4. Name the two sources of farm electricity.

5. Name four means of transporting electricity.

6. Indicate by placing an "X" in the blank which of the following statements represents a 230-volt service.

   _____a. Two lines running to the house

   _____b. Three lines running to the house

7. Name two types of power suppliers.

8. What is the name of the power supplier that serves the school area.

9. Define Ohm's law as related to electricity.

## TEST

10. What are the three types of electrical rates?

11. What are the two types of kilowatt-hour electric meters?

12. Complete Assignment Sheet #1 to the satisfaction of the instructor.

13. Complete Assignment Sheet #2 to the satisfaction of the instructor.

14. Complete Assignment Sheet #3 to the satisfaction of the instructor.

## HORTICULTURE MECHANICS

## UNIT 4

## ANSWERS TO TEST

1. a. A unit of measure of electric pressure.
   b. A device used to open or close a circuit.
   c. The wires which carry the electricity, or through which electricity flows
   d. A loss in electrical pressure from its source to its point of use.
   e. An instrument which records the amount of electrical energy in kilowatt-hours.
   f. The property of a substance that opposes the flow of current.
   g. 1,000 watts
   h. A unit of measure used in determining the rate of energy supplied.
   i. A source of energy that can be easily converted into light, heat, or power.
   j. A unit of measure of the rate of flow of electricity through a wire.

2. a. Light
   b. Power
   c. Heat
   d. Cooling
   e. Communications
   f. Special controls

3. Discussion should contain the following information:
   a. Electrons have negative charge
   b. Protons have positive charge
   c. Negative electrons move freely
   d. Negative electrons circulate about positive protons which form the nucleus of the atoms

4. a. Individual plant
   b. Central station and distribution lines

5. a. Transmission lines
   b. Distribution lines
   c. Service drop lines
   d. Feeder lines

## ANSWERS TO TEST

6. b

7. a. REA Cooperative

   b. Public or private companies

8. ______________________________

9. All electric circuits have a definite relationship between the pressure, the electron motion, and the opposition to current flow.

10. a. Residential

    b. Commercial

    c. Special

11. a. Cyclometer

    b. Pointer-dial

12. Complete Assignment Sheet #1 to the satisfaction of the instructor.

13. Complete Assignment Sheet #2 to the satisfaction of the instructor.

14. Complete Assignment Sheet #3 to the satisfaction of the instructor.

# HORTICULTURE MECHANICS

## UNIT 5

## ELECTRICAL SAFETY

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to demonstrate safety practices in working with electricity to protect life and property. They will be able to recognize danger areas when surveying their home and/or farm. This objective will be considered achieved through demonstration and by scoring at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Write the definition of five terms dealing with electrical safety.
2. Name five sources of electrical defects in equipment.
3. Name the two major causes of electrical accidents.
4. Name three ways of freeing a person that is receiving an electrical shock.
5. Discuss in a short paragraph the danger and damage caused by improperly using electricity and electrical equipment.
6. Discuss in a short paragraph the type of first aid that should be given to a person who has just received an electrical shock.
7. Match types of fires to the correct definition of each.
8. Select the proper fire extinguishers to use in controlling fire.
9. Select from a list of terms or statements the one that contributes to death due to electrical shock.
10. Identify the three types of common fuses.
11. Name five sure signs that wiring is out-of-date.
12. Name the three reasons why ciruits fail.
13. Identify four types of circuit protection devices.
14. Survey your home and/or farm for safe and unsafe electrical conditions.
15. Demonstrate the ability to use the National Electrical Code according to the "Official Interpretations" of the intent of the code.

# HORTICULTURE MECHANICS

## UNIT 5

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information and Assignment Sheets and a copy of the NEC
3. Make transparencies
4. Discuss Terminal and Specific Objectives
5. Discuss Information and Assignment Sheets
6. Counsel with students about safe and unsafe working conditions of electricity
7. Demonstrate the procedures for using the National Electrical Code.
8. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Complete Assignment Sheets
4. Survey home and/or farm for safe and unsafe electrical conditions.
5. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Transparency Masters
   - TM 1 - Safety Precautions
   - TM 2 - Types of Common Fuses
   - TM 3 - Circuit Protection Devices
4. Assignment Sheets
   - #1 - Survey Electrical Conditions on the Home Farm.
   - #2 - Use the National Electrical Code
5. Answers to Assignment Sheet #2
6. Test
7. Answers to Test

## SUGGESTED ACTIVITIES

References:

1. Simplified Electric Wiring Handbook, Sears-Roebuck and Company, Chicago, Illinois.
2. Brown, Robert H., Farm Electrification, New York: McGraw-Hill Book Company, Inc.
3. Phipps, Lloyd J., H.F. McColly, L.L. Scranton, and G.C. Cook, Farm Mechanics Text and Handbook, Danville, Illinois: The Interstate Printers and Publishers, Inc.
4. Farm Electricity, State of Tennessee, Department of Education, Division of Vocational Education.
5. Basic Electricity and Practical Wiring Lessons, The Pennsylvania State University, College of Agriculture, Department of Agricultural Education, University Park, Pennsylvania.
6. Recht, J.L. Accident Facts. Chicago, Illinois: National Safety Council.
7. National Electrical Code. Boston, Massachusetts: National Fire Protection Association.

# HORTICULTURE MECHANICS

## UNIT 5

## INFORMATION SHEET

I. Terms and Definitions.

- A. Fuse - A safety device which breaks the flow of electrical current when a circuit becomes overloaded.

  (NOTE: A fuse must be replaced when blown.)

- B. National Electric Code - A handbook that sets minimum standards for wiring and materials.
- C. Test lamp - A tool used in checking short circuits, hot lines, and voltages.
- D. Fusetron - A double element time delay fuse designed to withstand momentary overloads.
- E. Grounded wire (Ding) - A green or bare wire which serves as the third wire on 115-volt appliances to provide an easy path for electricity to flow from hot to ground in a shorted piece of equipment.
- F. Circuit - A completed path through which electricity flows.
- G. Circuit breaker - A safety device which breaks the flow of electrical current when a circuit becomes overloaded.

II. Electrical Defects in Equipment.

- A. Ground wire missing, broken, improperly connected, or not connected at all.
- B. Open conduits; switch boxes damaged or worn.
- C. Worn, wet, or oily insulation causing short circuits.
- D. Defective switches, receptacles, extension or lamp cords, and lamp sockets.

  (CAUTION: When handling lamp socket, keep bulb intact.)

- E. Dirty, improperly adjusted electrical equipment.
- F. Loose vibrating machine parts which might cause a short circuit.

III. Major Causes of Electrical Accidents.

- A. Carelessness
- B. Misuse

IV. Freeing a Person-Electrical Shock (TM 1)

(NOTE: 120-240 volt)

- A. Locate line wire or source of electrical current and disconnect

  (CAUTION: Do not take hold of the person's body with your bare hand.)

INFORMATION SHEET

B. Decide immediately whether it would be easier to move the person or move the conductor.

(CAUTION: If conductor is to be moved, use dry stick; if person's body is to be moved, use several thicknesses of paper or cloth as an insulator.)

C. With paper or cloth in hand, grasp the person's arm or leg and quickly pull him free of the conductor.

D. Over 240 volts

(CAUTION: If you see a downed wire, assume it is hot and can kill you. Protect the scene by posting a guard to keep passersby at least 200 feet away, then immediately call your power supplier and give them the exact location of the trouble.)

Phone ______________________________

V. Electrical Danger and Damage.

(NOTE: Figures are from the years 1967-1968 as compiled by the National Safety Council.)

A. 992 persons killed in 1967.

B. Contributes to 3 to 4 percent of all accidental deaths

C. Destroyed $149,600,000 worth of property in 1968.

(NOTE: Fixed services, fires due to wiring and equipment)

D. Destroyed $61,200,000 worth of appliances in 1968

(NOTE: Power consuming appliances)

VI. Proper First Aid.

A. Call doctor or ambulance immediately.

B. Only treatment is mouth-to-mouth resuscitation.

VII. Types of Fires.

A. Class A - Fires that occur in ordinary combustible materials, such as wood, rags, and rubbish.

B. Class B - Fires that occur with flammable liquids, such as gasoline, oil, grease, paints, and thinners.

C. Class C - Fires that occur in or near electrical equipment, such as motors, switchboards, and electrical wiring.

VIII. Types of Fire Extinguishers.

A. Pressurized water - Operates usually by squeezing a handle or trigger; used on Class A fires.

B. Soda acid - Operates by turning extinguisher upside down; used on Class A fires.

C. Carbon dioxide ($CO_2$) - Operates usually by squeezing handle or trigger; used on Class B and C fires.

D. Dry chemical - Operates usually squeezing a handle, trigger, or lever; used on Class B or C fires.

E. Foam - Operates by turning extinguisher upside down; used on Class A and B fires.

IX. Electrical Death.

A. Current kills, not voltage.

B. Voltage is involved.

C. Example - Less than ½ ampere will stop the heart

(NOTE: Current flowing in a 25-watt lamp at 115 volts is enough to stop the heart of an average man.)

X. Types of Common Fuses (TM 2).

A. Plug

B. Cartridge

C. Blade

XI. Sure Signs that Wiring is Out-of-Date.

A. Fuses blow

B. Circuit breakers trip

C. Lights dim, blink, flicker

D. Television picture wobbles

E. Appliances need longer heating time

F. Air conditioner fails to do its job

G. Motors are slow to come up to normal speed

XII. Reasons Why Circuits Fail.

A. Circuit overloaded

B. Fuse or breaker too small

C. Short circuit

D. Wire broken

E. Equipment defective

XIII. Circuit Protection Devices (TM 3)

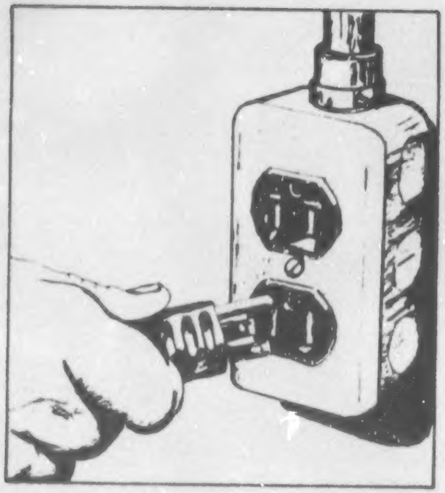
A. Fuse

B. Fusetron

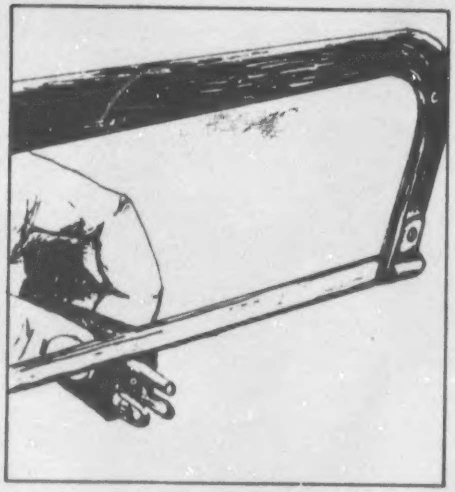
C. Fustat

D. Circuit breaker

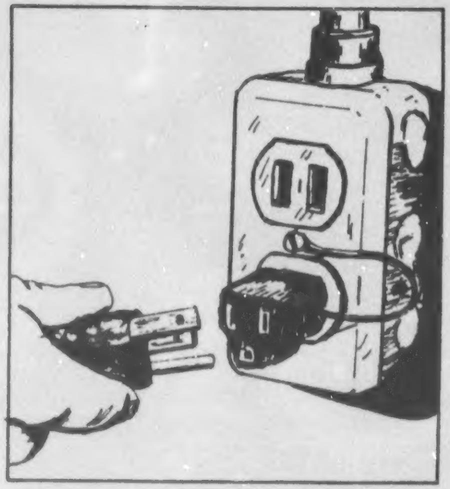
# Safety Precautions



Modern homes have three-wire receptacles.

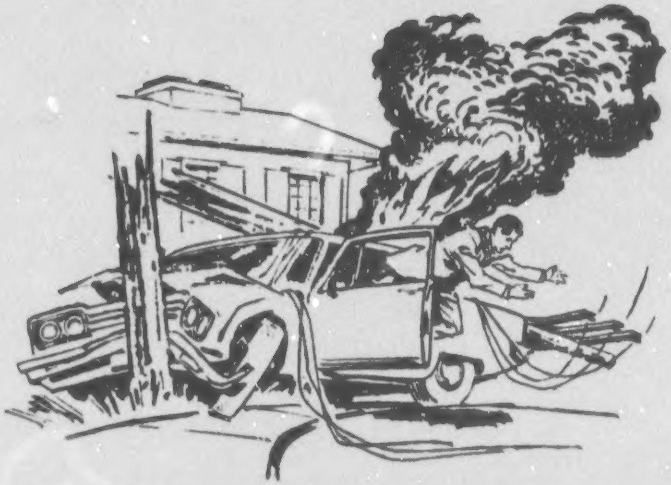


Never cut off the third prong.

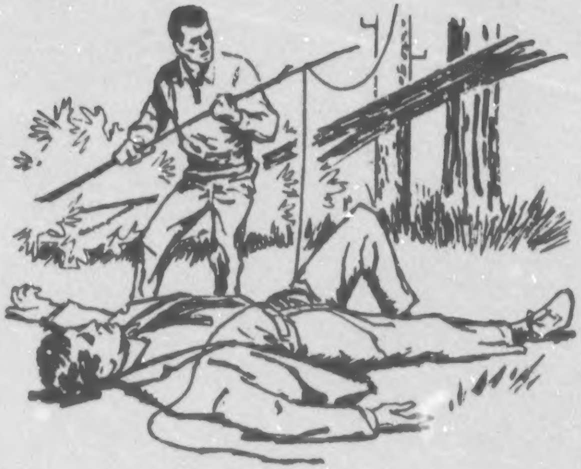


Use adaptor on old-type receptacle.

# Safety Precautions

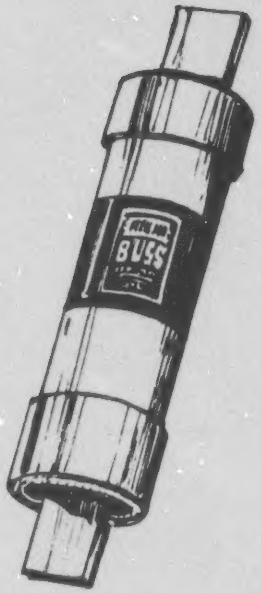


If a hot wire is in contact with a vehicle and the occupant must get out quickly, he should leap without touching the car again.

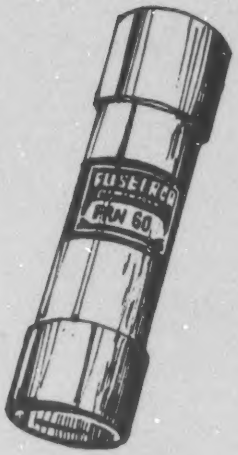


To remove a downed wire from a victim, use a non-conductor such as a long dry wooden or plastic pole or a very dry tree branch.

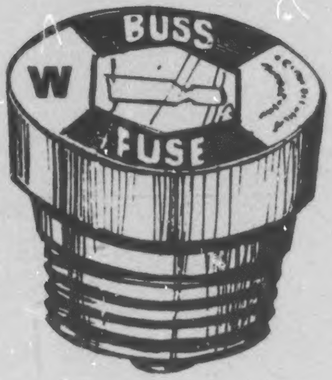
# Types of Common Fuses



Blade

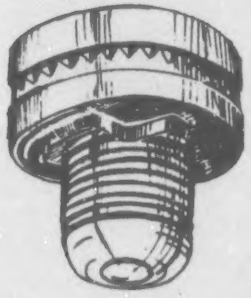

FUSETRON
FRN 60

Cartridge

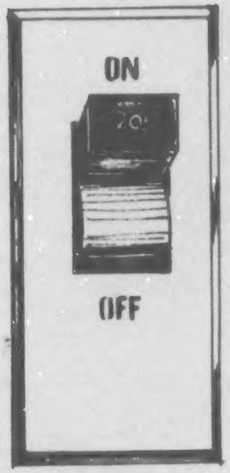


Plug

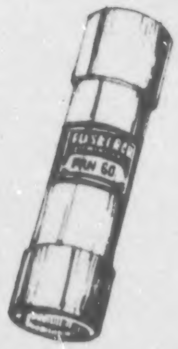
# Circuit Protection Devices



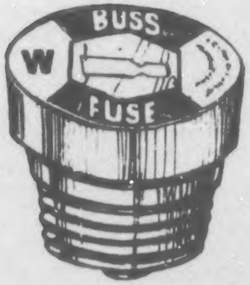
Fustat



Circuit Breaker


FUSETRON
FRN 60

Fusetron



Fuse

## HORTICULTURE MECHANICS

## UNIT 5

## ASSIGNMENT SHEET #1: Survey Electrical Conditions.

Answer each question either yes or no if the question applies to your local situation. When completed return to class and turn in to instructor for discussion.

1. Are light cords hung over nails?
2. Are cords showing signs of wear?
3. Do switches work properly?
4. Are lamps touching flammable material?
5. Do lamps touch the wall?
6. Will clothing touch the light globes?
7. Is the lamp cord wrapped around bedstead or fastened to woodwork?
8. Are the floor lamp cords worn?
9. Can the floor lamp cords be stepped on?
10. Is the television set well away from curtains?
11. Is the television set well-ventilated in the back?
12. Is the electric warming pad approved?
13. Are cords found under the rug?
14. Are there enough electrical outlets?
15. Are wires strung through doors?
16. Are any wall receptacles broken?
17. Are all appliances Underwriters' Laboratories approved?
18. Is the refrigerator motor clean?
19. Is the ventilating fan clean?
20. Do fuses "blow" and breakers trip when appliances are connected? (If so, circuit is overloaded.)
21. Is the pressing iron in good order?
22. Are signal lights working properly on appliances?
23. Is washing machine in good order? Does the cord show signs of wear?
24. Are the motors of dryer and washing machine free of lint and oil?
25. Is the lighting circuit fuse or breaker larger than 15 ampere?
26. Have fuses or circuit breakers been tampered with? (Pennies or other forms of dangerous substitutes used?)
27. Is main switch clean and in good order?
28. Is the panel switch door kept closed?

## ASSIGNMENT SHEET #1: Survey Electrical Conditions

29. Are extra fuses kept on hand?

30. Are overhead wires to outbuildings properly supported and high enough for proper clearance of vehicles passing under such wires? (10 feet above walkways, 18 feet above driveways.)

31. Are outbuildings properly grounded for lightning protection?

## HORTICULTURE MECHANICS

## UNIT 5

### ASSIGNMENT SHEET #2: Use the National Electrical Code.

The following statements are based on the National Electrical Code. Each question should be answered either true or false, depending on the official interpretation of the code.

1. Where the service-entrance conductors are paralleled in two or more raceways, the size of the bonding jumper for each raceway shall be based on the size of service conductors in each raceway.
2. The rating of any one portable appliance shall not exceed 50% of the branch circuit rating.
3. The smallest size wire permitted to be used for a run overhead from house to garage 45 feet away is #10.
4. All circuits supplying gasoline dispensing pumps shall be controlled by a double pole disconnecting means.
5. In clothes closets, wall lights may be installed above door.
6. All appliances must be provided with a disconnecting means.
7. Threadless couplings and fittings are approved in Class 1.
8. All major exposed metal parts of a mobile home must be bonded to the grounding terminal of the distribution panel.
9. Electric ranges and clothes dryers in a mobile home may be connected with a four-wire cord.
10. The NEC permits the use of overcurrent devices which employ the multiple connection of fuses.
11. Splices and taps may be located within fixture arms or stems.
12. Underground cable running under a building shall be in a raceway that is extended beyond the outside wall of the building.
13. A grounding conductor may be run in the same metal raceway with other conductors of the system to which it is connected.
14. Circuits of less than 50 volts need not be grounded under any conditions.
15. Circuit breakers and plug fuses installed in residential occupancies on circuits 6f 20 amperes or less shall be of the time-delay type.
16. Individual branch circuits may supply any loads.
17. The installation of grounding type outlets shall not be usdd as a requirement that all portable equipment be of the grounded type.

ASSIGNMENT SHEET #2: Use the National Electrical Code

18. The minimum size service drop conductor shall not be smaller than No. 8 copper or equivalent except for a limited load.

19. Fixture conductors shall not be smaller than No. 18 AWG.

20. All splices other than factory splices shall be made in properly installed junction boxes approved for the location.

Questions 1-10: Courtesy IAEI News, International Association of Electrical Inspectors.

# HORTICULTURE MECHANICS

## UNIT 5

## ANSWERS TO ASSIGNMENT SHEET #2

1. False - Section 250-94
2. False - Section 210-24
3. True - Section 730-6 (a)
4. True - Section 514-5
5. True - Section 410-8 (a-1)
6. True - Section 422-20
7. False - Section 501-4
8. True - Section 550-9 (a-2)
9. True - Section 550-9 (c)
10. False - Section 240-14
11. False - Section 410-25
12. True - Section 300-7
13. True - Section 250-98
14. False - Section 250-8
15. True - Section 240-4
16. True - Section 210-24
17. True - Section 210-20
18. True - Section 230-23
19. True - Section 410-8
20. True - Section 422-77

# HORTICULTURE MECHANICS

## UNIT 5

## TEST

1. Define the following terms.
   a. Test lamp
   b. Grounded ding wire
   c. Circuit
   d. Fuse
   e. National Electrical Code

2. Name five sources of electrical defects in equipment.

3. Name two major causes of electrical accidents.

4. Name three ways of freeing a person that is receiving an electrical shock.

5. Discuss in a short paragraph the danger and damage caused by improperly using electricity and electrical equipment.

6. Discuss in a short paragraph the type of first aid that should be given to a person who has just received an electrical shock.

7. Match the types of fires with the correct definition.

_____a. Fires that occur with flammable liquids such as gasoline, oil, grease, paint, and thinners.

_____b. Fires that occur in or near electrical equipment such as motors, switchboards, and electrical wiring.

_____c. Fires that occur in ordinary combustible materials such as wood, rags, and rubbish.

1. Class A
2. Class B
3. Class C

8. From the list of fire extinguishers below select the ones you would use to control an electrical fire by circling the correct letters.
   a. Soda acid
   b. Carbon dioxide
   c. Foam
   d. Dry chemical
   e. Pressurized water

## TEST

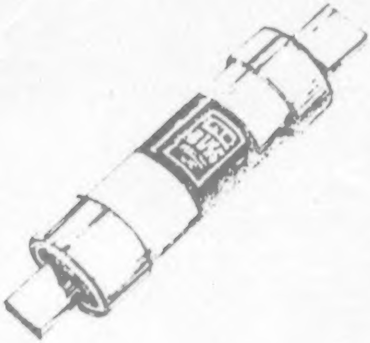
9. Place an "X" in front of the following terms which contribute to death due to receiving an electrical shock.

   a. Wattage

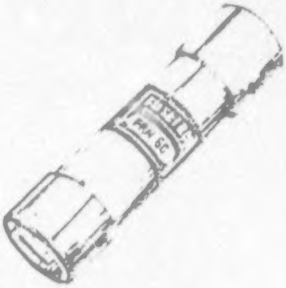
   b. Amperes

   c. Voltage

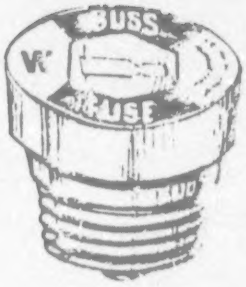
10. Identify the following types of fuses.



a.____________



b.____________

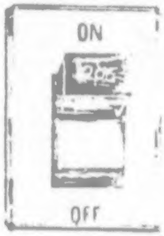


c.____________

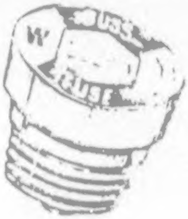
11. Name five sure signs that wiring is out-of-date.

12. Name three reasons for circuit failure.

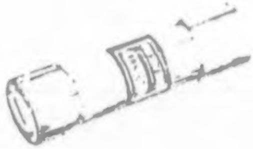
13. Identify the following types of circuit protection devices.



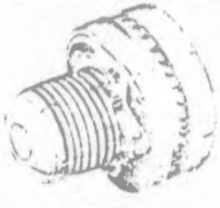
a.______________________________



b.______________________________



c.______________________________



d.______________________________

# HORTICULTURE MECHANICS

## UNIT 5

## ANSWERS TO TEST

1. a. A tool used in checking short circuits.
   b. A green or bare wire which serves as the third wire on 115-volt appliances to provide an easy path for electricity to flow from hot to ground in a shorted piece of equipment.
   c. A completed path through which electricity flows.
   d. A safety device which breaks the flow of electrical current when a circuit becomes overloaded.

2. Any five of the following.
   a. Ground wire missing, broken, improperly connected, or not connected at all.
   b. Open conduits; switch boxes damaged or worn.
   c. Worn, wet, or oily insulation causing short circuits.
   d. Defective switches, receptacles, extension cords, and lamp sockets.
   e. Dirty, improperly adjusted electrical equipment.
   f. Loose vibrating machine parts which might cause a short circuit.

3. a. Carelessness
   b. Misuse

4. a. Locate line wire or source of electric current and disconnect
   b. Decide whether to move person or move conductor.
   c. With some type of insulator in your hand, grasp person's arm or leg and quickly pull him free.

5. Discussion should contain the following:
   a. 992 person killed in 1967.
   b. Contributes from 3 to 4 percent of all accidental deaths
   c. Destroyed $149,600,000 worth of property in 1968
   d. Destroyed $61,200,000 worth of appliances in 1968.

6. Discussion should include the following statements:
   a. Call doctor or ambulance immediately
   b. Only treatment is mouth-to-mouth resuscitation

## ANSWERS TO TEST

7. a. 2
   b. 1
   c. 3

8. b,d

9. b

10. a. Blade
    b. Cartridge
    c. Plug

11. Any five of the following:
    a. Fuses blow
    b. Circuit breaker trips
    c. Lights dim, blink, flicker
    d. Television picture wobbles
    e. Appliances need longer heating time
    f. Air conditioner fails to do its job
    g. Motors are slow to come up to normal speed

12. Any three of the following:
    a. Circuit overloaded
    b. Fuse or breaker too small
    c. Short circuit
    d. Wire broken
    e. Equipment defective

13. a. Breaker
    b. Fuse
    c. Fusetron
    d. Fustat

# HORTICULTURE MECHANICS

## UNIT 6

## ELECTRICAL WIRING PRACTICES

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to identify electrical tools, devices, and conductors. They will be able to recognize factors determining correct wire size to use and to select wire size for safety, economy, and quality service, and demonstrate their ability to wire receptacles and lighting outlets. This objective will be evidenced through demonstration and by scoring at least eighty-five percent on the test.

### SPECIFIC OBJECTIVE

After completion of this unit, students will be able to:

1. Define five terms associated with electrical wiring.
2. Identify ten tools used in electrical wiring when given the tools or a drawing illustrating the tools.
3. Identify the electrical devices when given the devices or a drawing.
4. Identify ten conductors as either wire, cord, or cables; tell type of insulation, wire size, AWG, or cir. mills; and give the use of each.
5. Name three factors affecting voltage drop.
6. Name the three-step procedure to follow in wiring.
7. Draw a schematic diagram showing two lights connected in a series and controlled by a switch.
8. Distinguish between wiring diagrams and schematic diagrams.
9. Demonstrate the procedure for performing the following jobs:
    a. Wire a lighting outlet controlled by a single-pole switch.
    b. Wire three duplex receptacles using non-metallic cable.
    c. Wire a lighting outlet controlled by two three-way switches.

## HORTICULTURE MECHANICS

## UNIT 6

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with Objective Sheet
2. Provide students with Information Sheets
3. Make transparencies
4. Discuss Terminal and Specific Objectives with students
5. Discuss Information Sheets with students
6. Demonstrate procedures for completing Job Sheets
7. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Demonstrate ability to complete procedures outlined in Job Sheets
4. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information Sheets
3. Transparency Masters
   TM 1 - Electrical Wiring Tools
   TM 2 - Electrical Wiring Tools
   TM 3 - Electrical Devices
4. Job Sheets
   #1 - Wire a Lighting Outlet Controlled by a Single-Pole Switch
   #2 - Wire Three Duplex Receptacles Using Non-Metallic Cable
   #3 - Wire a Lighting Outlet Controlled by Two Three-Way Switches
5. Test
6. Answers to Test

References:

1. Brown, Robert H. Farm Electrification. New York: McGraw-Hill Book Company, Inc.

## SUGGESTED ACTIVITIES

2. Phipps, Lloyd J., H.F. McColly, L.L. Scranton, and G.C. Cook, Farm Mechanics Text and Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc.
3. Farm Electricity, State of Tennessee, Department of Education, Division of Vocational Education.
4. Basic Electricity and Practical Wiring Lessons, The Pennsylvania State University, College of Agriculture, Department of Agricultural Education, University Park, Pennsylvania.

# HORTICULTURE MECHANICS

## UNIT 6

## INFORMATION SHEET

I. Terms and Definitions.

A. Conductors - The wires which carry the electricity or through which electricity flows.

B. Terminal - A device attached to the end of a wire or cable or to an electrical apparatus for convenience in making connections.

C. Schematic diagram - A step used in electrical wiring showing the connections that need to be made.

D. Wiring diagram - The plan which shows the electric circuit with items arranged and appearing so the job of connecting will be simplified.

E. Junction box - An outlet with a blank cover used to contain splices of a circuit.

F. Cable - Two or more wires put together inside an overall covering.

G. Cord - Several small wires wrapped in insulation, then covered with another layer of insulation.

H. Outlet box - A box-like device which is used to bring the wires to the location where a switch or outlet is installed.

I. Receptacle outlet - A device which contains the splices when a circuit is tapped for an appliance or a light.

J. Conduit - A thin-walled steel pipe used to protect electrical wires

K. Single-pole toggle switch - A switch used to break the current in a single place.

L. 3-Way switch - A switch used to control lights and motors from two different places.

M. 4-Way switch - A switch used to control lights and motors from three or more different places.

N. Wire gauge - A tool used to measure wire diameter

O. Wire size - The measure of a wire diameter.

P. Wire - A single conductor which carries electricity.

II. Electrical Wiring Tools (TM 1 & 2)

A. Needle-nose pliers

B. Lineman's pliers

C. Diagonal pliers

D. Wire strippers

E. Screwdrivers

1. Standard
2. Phillips

## INFORMATION SHEET

F. Pocket knife

G. Hammer

H. Wood chisel

I. Electric Drill

J. Tape or Rule

K. Keyhole saw

L. Hacksaw

M. Test lamp

N. Amp volt meter

O. Vise-grip pliers

P. Fish tape and reel

Q. Conduit bender

III. Electrical Devices (TM 3).

A. Single element fuse, 30-amp, Edison plug type

B. Time delay fuse, 25-amp, Edison plug type

C. Time delay fuse, 40-amp, cartridge type

D. Polarized heavy duty plug cap, 230-V., 15 amp

E. Fuse box cover/grounded outlet for fractional hp motor protection

F. Single element fuse box, 50-amp, cartridge type

G. 1/2" connector for NM cable

H. 15-amp duplex, 115/230V., grounded receptacle, 3-wire

I. 15-amp duplex, 115-V. grounded receptacle, 3-wire

J. 50-amp, 115/230 V., cord receptacle cap

K. 50-amp, surface receptacle, 3-wire, 115/230-V.

L. 3-wire receptacle, 30-amp, 115/230-V., twist lock

M. Single-pole, single-throw 10-amp, toggle wall switch

N. Single-pole, double-throw, or 3-way, 10-amp, toggle wall switch

O. Crow foot polarized cord cap, 20-amp, 3-wire, 230-V.

P. Polarized twist lock plug cap, 20-amp, 115/230-V., 3-wire.

Q. Handy box 1/2" knock-out and cover for toggle switch

R. Handy box 1/2" knock-out and cover for duplex receptacle.

S. Wall box with clamps and beveled corners for switch or receptacle

T. 4" x 1½" octagon box, 1/2" knock-outs for ceiling outlets or junction box

# INFORMATION SHEET

## IV. Conductors.

| NO. | ITEM | TYPE | AM. WIRE GAUGE | USE | REFERENCE |
|---|---|---|---|---|---|
| A. | Wire | A (392 1/4) | 16STD | Heating Appliances Within Apparatus-Dry Locations | P.94 NEC |
| B. | Wire | TW(140 1/4) | 14 | Inside of Conduit Dry and Wet Locations | P.93 NEC |
| C. | Wire | USE | 10 | Trench-Lay - Under Ground | P.127 NEC |
| D. | Wire | TW (Low Voltage) | 18 | Low Voltage Alarm Or Relay Controls | |
| E. | Cord | HPN | 16/2 | Heater Cord | P.176 NEC |
| F. | Cord | S | 12/3 | Hard Usage-Welders Large Motors | P/75 NEC |
| G. | Cord | HS | 16/2 | Iron, Heaters | P.175 NEC |
| H. | Cord | SJ | 18/2 | Portable Tools | P/74 NEC |
| I. | Cord | SV | 18/2 | Vacuum Cleaners-Mixers | P.174 NEC |
| J. | Cable | Triplex | 6/3 | Outside-Overhead Service | |
| K. | Cable | UF | 10/2 | Underground-Feeder And Branch Circuits | P.128 NEC |
| L. | Cable | NM | 11/2G | Inside-Dry Locations | P.126 NEC |

## V. Factors Affecting Voltage Drop.

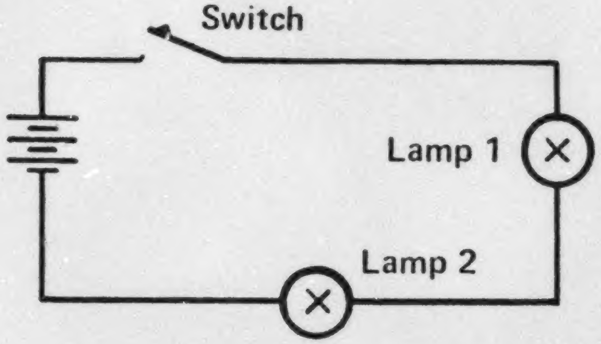
A. Length of wire
B. Size of wire
C. Number of amps flowing through wire
D. Type of conductor

## VI. Procedures to Follow in Wiring.

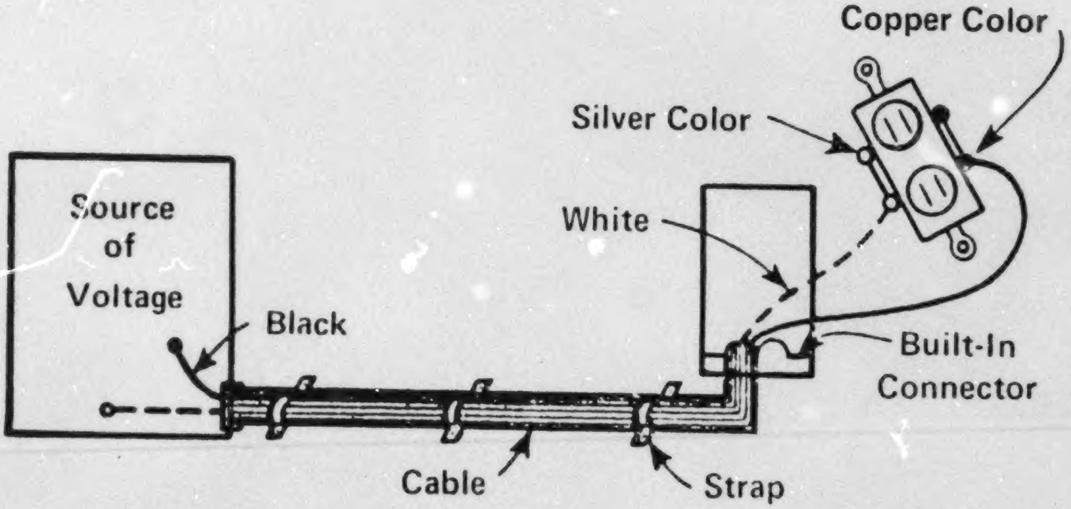
A. Draw the schematic diagram
B. Draw the wiring diagram
C. Install wire according to wiring diagram

INFORMATION SHEET

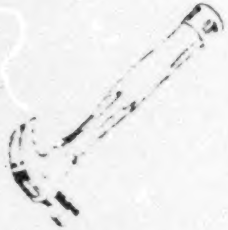
VII. Schematic Diagram.


Switch
Lamp 1
Lamp 2

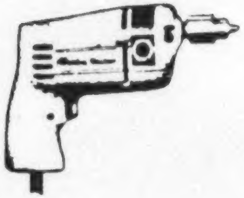
VIII. Wiring Diagram.


Copper Color
Silver Color
White
Source of Voltage
Black
Built-In Connector
Cable
Strap

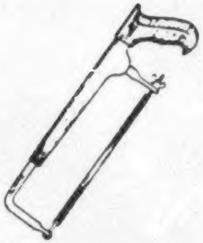
# Electrical Wiring Tools



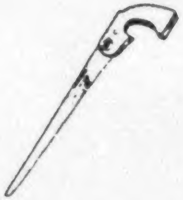
Hammer



Electric Drill

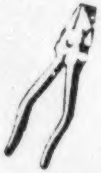


Hacksaw

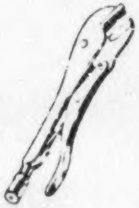


Keyhole Saw

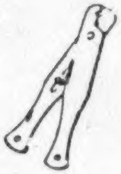
Needle Nose Pliers



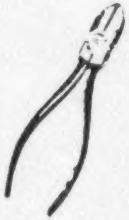
Lineman's Pliers



Vise-Grip Pliers

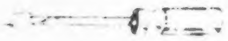


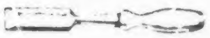
Wire Cutter, Stripper

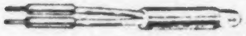


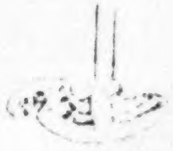
Diagonal Pliers

# Electrical Wiring Tools

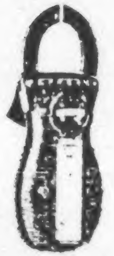

Screwdriver

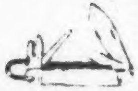

Chisel

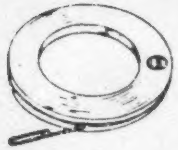

Test Light


Conduit Bender

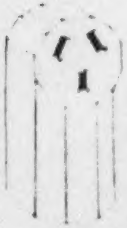
6-foot Folding Rule


Amp Volt Meter

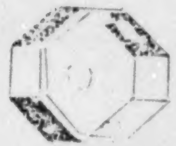

Jackknife


Fish Tape and Reel

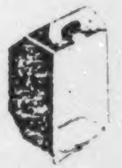
# Electrical Devices



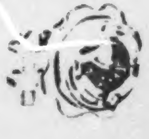
50 Amp 115/230 v. Cord Receptacle Cap



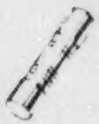
Octagon Box



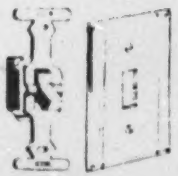
Beveled Corners Wall Box



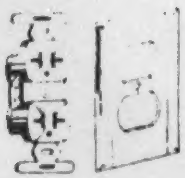
Connector



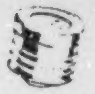
Time Delay Fuse 40 Amp Cartridge Type



Toggle Wall Switch and Cover



Duplex Receptacle and Cover



Single Element Fuse 30 Amp Edison Plug Type

# HORTICULTURE MECHANICS

## UNIT 6

## JOB SHEET #1: Wire a Lighting Outlet Controlled By a Single-Pole Switch

I. Tools and Equipment:

A. Standard screwdriver

B. Lineman's pliers

C. Needle-nose pliers

D. Knife or strippers

II. Materials:

A. Lighting outlet

B. Octagon box

C. Single-pole toggle switch

D. Handy box for single-pole switch

E. 2 pieces of No. 12/2 NM wire, 2 feet long

F. 1 piece of 2' x 3' x 1/4" plywood

III. Procedures:

A. Attach box for single pole switch to demonstration board (Figure A)

B. Remove knock-out plugs and loosen screw in box and place one piece of NM wire under plate and allow approximately six inches extending from box (Figure B)

C. Remove five inches of outside insulation on wire (Figure C)

D. Tighten screw in box

E. Remove approximately 1" to 1½" of insulation from each wire

(CAUTION: This should be done in such a manner to not scratch or mark the wire)

F. Secure octagon box to demonstration board and remove knock-out plugs which are located directly across from each other (Figure A)

G. Using the remainder of wire extending from handy box, run to octagon box, and use the same procedures for fastening wire to octagon box as in fastening to handy box.

H. Remove five inches of outside insulation from wire.

I. Remove approximately 1½" of insulation from each wire.

J. Using the extra piece of wire, remove six inches of outside insulation and 1½" of insulation from each wire and place through octagon box and secure box.

## JOB SHEET #1: Wire a Lighting Outlet Controlled by a Single-Pole Switch.

(NOTE: The end of wire extending from octagon box will be connected to electrical source.)

K. Connect single-pole toggle switch to wires extending from handy box.

(NOTE: Wires should be placed around terminals on switch according to the way the screw tightens.) (Figure D)

L. Connect black hot wire to brass side of lighting outlet.

(NOTE: Procedures should be the same for connecting the terminals) (Figure E)

M. White wire from switch should be connected to black wire which is designated as the source wire.

(NOTE: This connection should be made with a pigtail splice and by using an insulation cap) (Figure F)

N. White source wire should be connected to the silver terminal on lighting outlet (Figure E)

O. Place wires in handy box and fasten toggle switch to box (Figure G)

P. Connect wire extending from octagon box to the electrical source.

Q. Turn switch off and on to see if wiring is correct.

(CAUTION: Be sure to have instructor's approval before performing this step.)

## JOBSHEET #1: Wire a Lighting Outlet Controlled by a Single-Pole Switch.

### IV. Diagram of Procedure:

Figure A

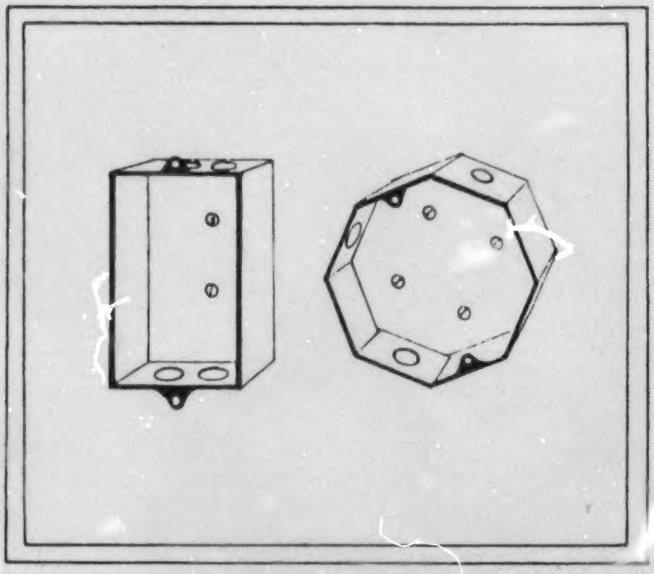


Figure B

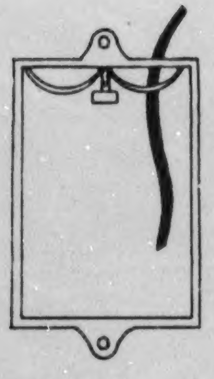
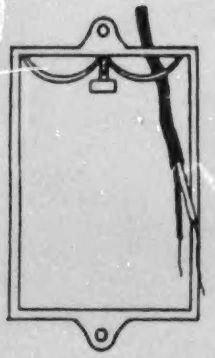


Figure C



## JOBSHEET #1: Wire a Lighting Outlet Controlled by a Single-Pole Switch.

IV. Diagram of Procedure:

Figure D

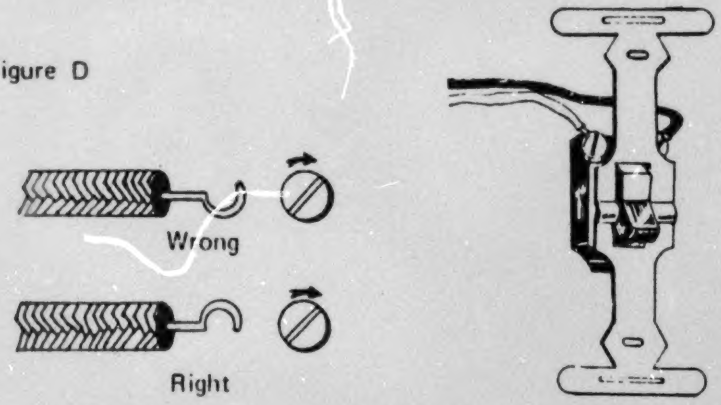
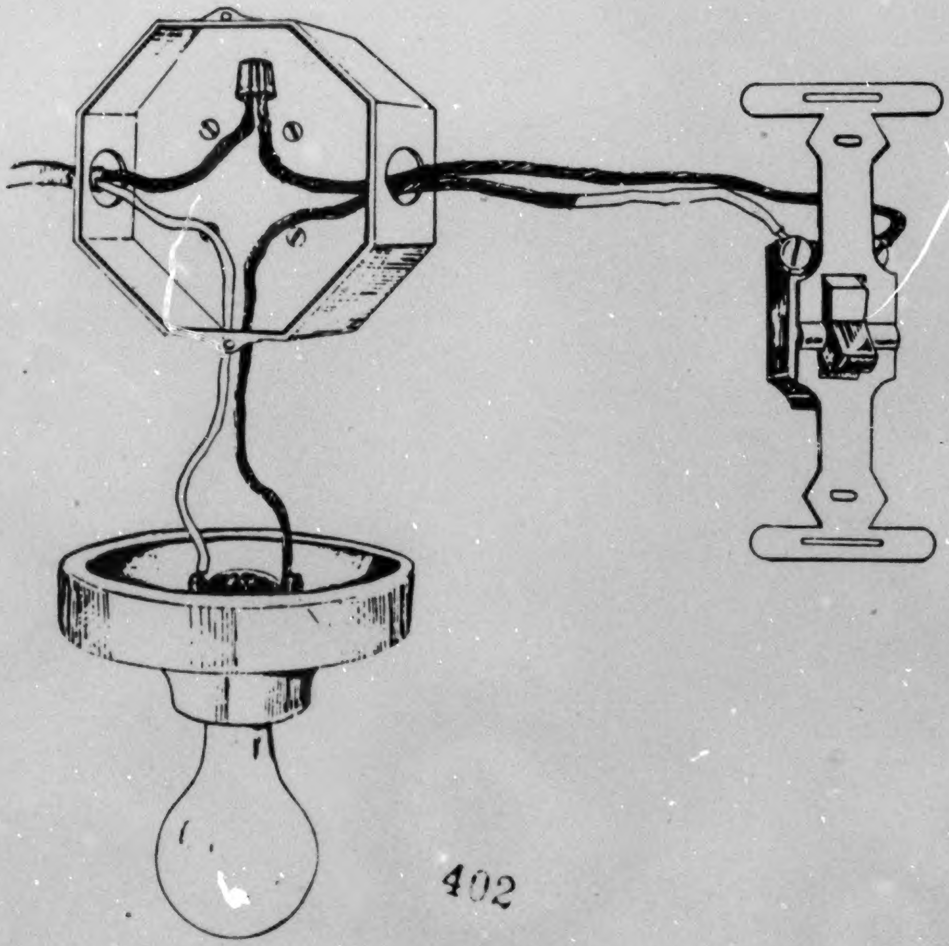


Figure E



## JOB SHEET #1: Wire a Lighting Outlet Controlled by a Single-Pole Switch.

IV. Diagram of Procedure:

Figure F

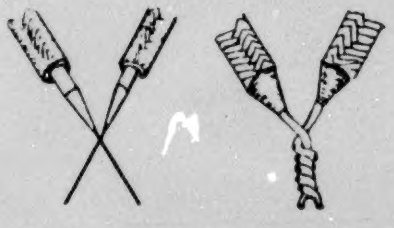
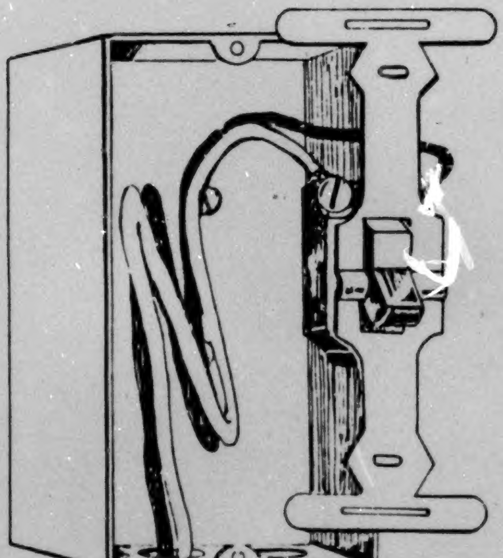


Figure G



# HORTICULTURE MECHANICS

## UNIT 6

## JOB SHEET #2: Wire Three Duplex Receptacles Using Non-Metallic Cable

I. Tools and Equipment:

A. Standard screwdriver

B. Lineman's pliers

C. Needle-nose pliers

D. Knife or strippers

II. Materials:

A. Three duplex receptacles

B. Three flush wall boxes for receptacles

C. Three duplex receptacle cover plates

D. One piece of plywood, 1/4" x 2' x 3'

E. Three pieces of No. 12/2 g NM wire 24 inches long

(NOTE: Number wires, 1, 2, and 3)

III. Procedure:

A. Secure receptacle flush wall boxes to demonstration board (Figure A).

B. Remove knock-out plugs on box A and B on both ends, but remove only one knock-out on box C.

C. Loosen screw inside all three handy boxes (Figure B).

D. Starting with box C, place wire one under screw plate allowing six inches to extend from box and then tighten screw.

(CAUTION: Tighten screw firmly but do not cut insulation) (Figure C).

E. Place remaining end of wire one under screw plate of box B allowing six inches to extend from the box and tighten screw.

F. Place wire two in box B under screw plate of box allowing six inches to extend from the box and tighten screw.

G. Place the remaining end of wire two in box A under screw plate of box allowing six inches to extend from box and tighten screw.

H. Place wire one under screw plate of box A allowing six inches to extend from the box.

I. Remove approximately five inches of the outside insulation on each wire extending from the handy boxes.

(NOTE: Remember to use caution in removing insulation)

J. Remove approximately 1 to 1½" of insulation from each wire extending from handy boxes .

JOBSHEET #2: Wire Three Duplex Receptacles Using Non-Metallic Cable

K. Starting with box C, attach black hot wire to brass side of receptacle.

(NOTE: Wire should be placed around terminals according to the direction the screw tightens.) Figure D)

L. Attach white neutral wire to silver side of receptacle (Figure E)

M. Attach green ground wire to the top of receptcle (Figure E)

N. Same procedures should be followed for attaching wires to receptacles A and B.

O. Assemble wires with receptacle and place in handy box; attach cover plate

P. Check with instructor for approval before attaching wire three to electrical source.

## JOB SHEET #2: Wire Three Duplex Receptacles Using Non-Metallic Cable

### IV. Diagram of Procedure:

Figure A

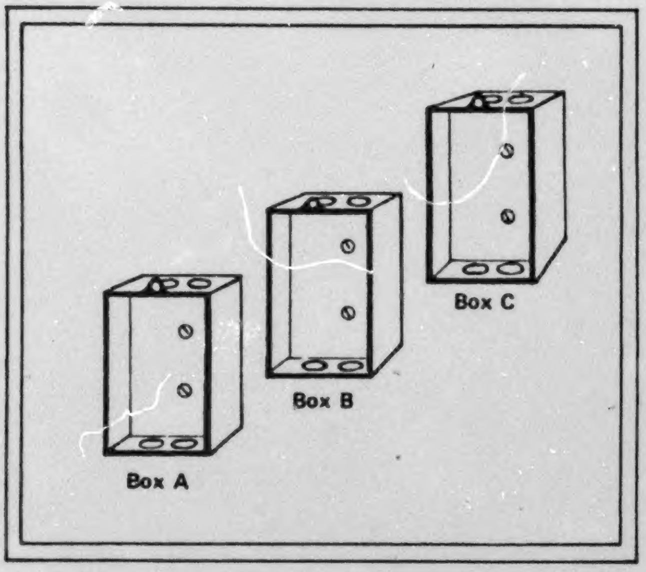


Figure B

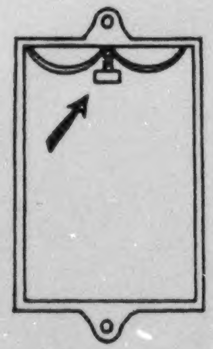
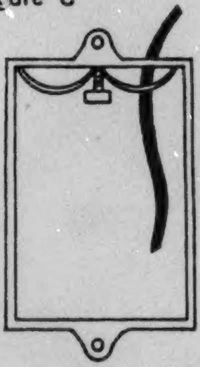


Figure C



JOBSHEET #2: Wire Three Duplex Receptacles Using Non-Metallic Cable

IV. Diagram of Procedure:

Figure D

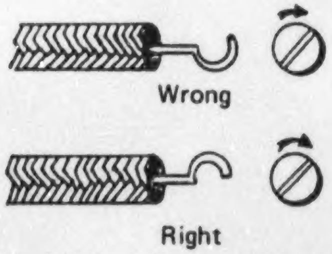
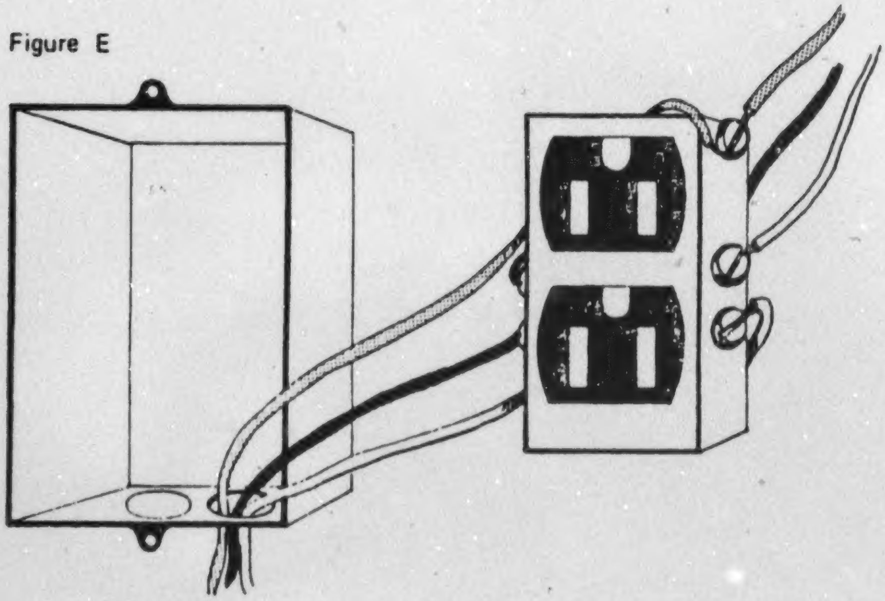
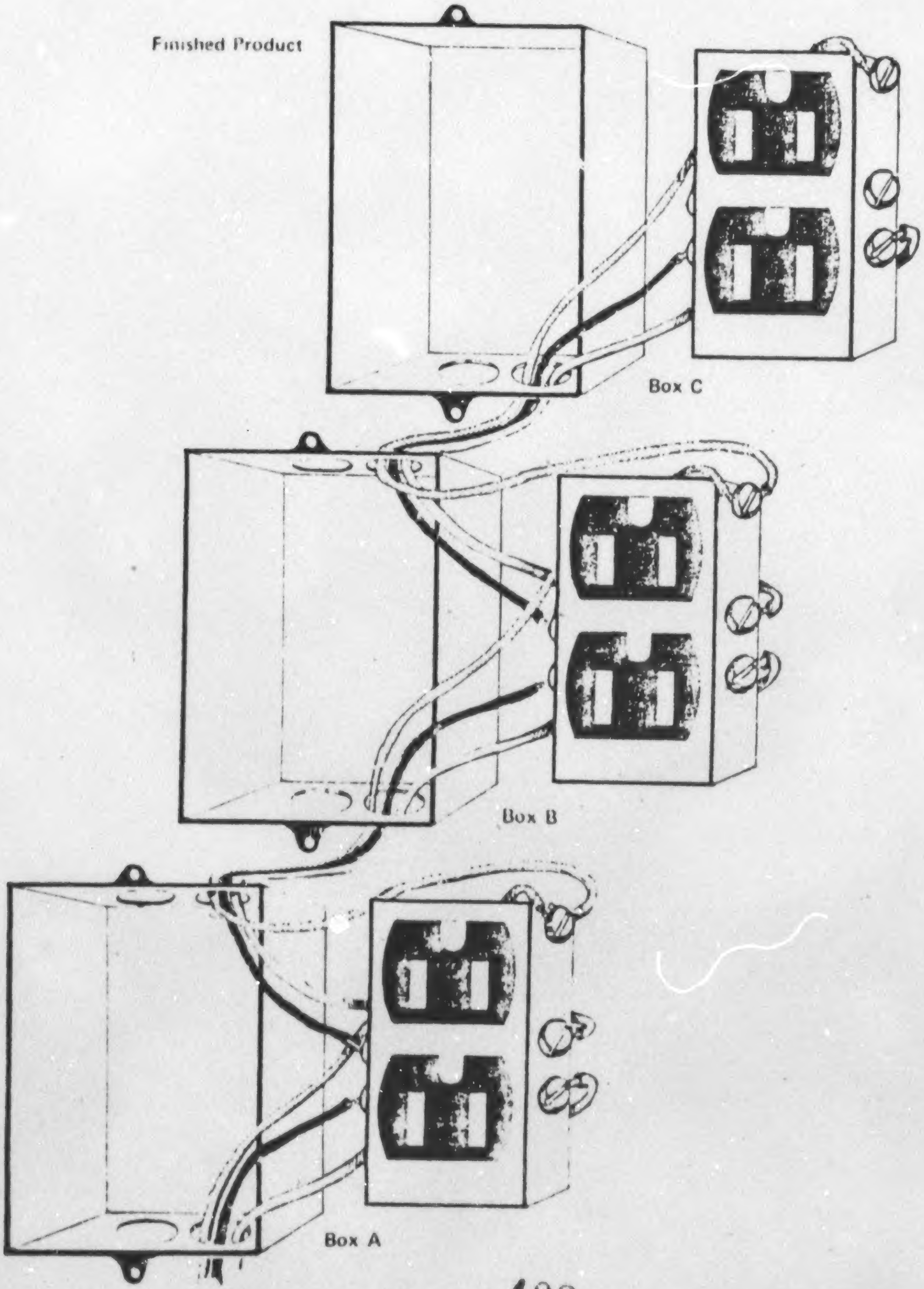


Figure E



JOB SHEET #2: Wire Three Duplex Receptacles Using Non-Metallic Cable

IV. Diagram of Procedure:


Finished Product
Box C
Box B
Box A

# HORTICULTURE MECHANICS

## UNIT 6

## JOB SHEET #3: Wire a Lighting Outlet Controlled by Two Three-Way Switches

I. Tools and Equipment:

   A. Standard screwdriver

   B. Lineman's pliers

   C. Needle-nose pliers

   D. Knife or strippers

II. Materials:

   A. Lighting outlet

   B. Octagon box

   C. Two three-way switches and cover plates

   D. Two flush mount wall boxes

   E. Black tape for tracer marking

   F. Two pieces of 12/3 NM cable, two feet long

   (NOTE: In this job, the 12/3 NM cable contains 3 wires; white (the neutral) will be used as a hot carrier and requires a tracer wire marking. The black wire will be the hot wire, and the red wire will be used as a hot carrier wire.)

   G. One piece of 12/2 NM cable, 2 feet long.

   H. One piece of 2' x 3' x 1/4" inch plywood

III. Procedure:

   A. Attach octagon box and both wall boxes to plywood (Figure A)

   B. Remove approximately five inches of the outside insulation on each end of the NM cable.

   C. Remove knock-out plug from wall box and loosen screw in box; place one 12/3 NM cable under plate and allow approximately six inches to extend from box and tighten screw.

   (CAUTION: Be careful not to tighten screw too tight because of cutting insulation on wire.)

   D. Remove 1 to 1½ inch of insulation from wire.

   (CAUTION: This should be done in such a manner to not scratch or mark the wire.)

   E. Remove knock-out plugs on octagon box located directly across from each other.

   F. Using the remainder of wire extending from wall-box, run to octagon

JOB SHEET #3: Wire a Lighting Outlet Controlled by Two Three-Way Switches

box and use the same procedure for fastening wire to octagon box as in fastening to wall box.

G. Repeat the same procedure with the other 12/3 NM cable connecting the other wall box to the octagon box.

(NOTE: While conducting this step, you will need to repeat steps C, D, and F.)

H. Remove five inches of outside insulation from both ends of the 12/2 NM cable.

I. Knock out one of the remaining plugs in the octagon box.

J. Pull six inches of the cable through the box and secure to clamp; remove one inch of insulation from each wire

(CAUTION: This should be done in such a manner not to scratch or mark the wire)

(NOTE: The other end of this cable extending from octagon box will be connected to source at completion of job.)

K. In wall box #1, connect black wire to three-way switch on screw C; connect red wire to screw A and white wire with tracer to screw B (Figure C)

L. In wall box #2, connect black wire to the other three-way switch on screw C, the red wire to screw A, and the white wire with tracer to screw B (Figure C)

(NOTE: Wire should be placed around terminals on switch according to the way the screw turns.)

M. Connect the two red wires in the octagon box together using a pigtail splice and connecting cap.

N. Connect the two white wires, with tracers in the octagon box together using a pigtail splice and connecting cap.

O. Connect the black wire from the source to the black wire going to switch #1 using a pigtail splice

P. Connect the black wire from switch #2 to the brass screw on the light fixture

Q. Connect the white wire from source to the silver screw on the light fixture

(CAUTION: Check with instructor before performing the next three steps.)

R. Place wires in wall boxes and fasten switches to the boxes; install switch cover plates.

S. Place wires in octagon box and fasten light fixture to box

(CAUTION: Do not overtighten fixture.)

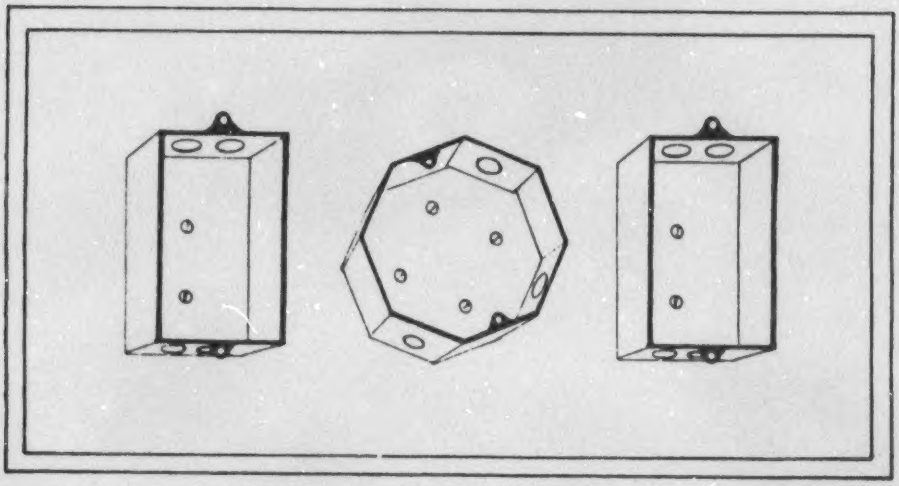
T. Connect wire extending from octagon box to source

JOB SHEET #3: Wire a Lighting Outlet Controlled by Two Three-Way Switches

U. Turn switches off and on to see if job is correct.

IV. Diagram of Procedure:

Figure A



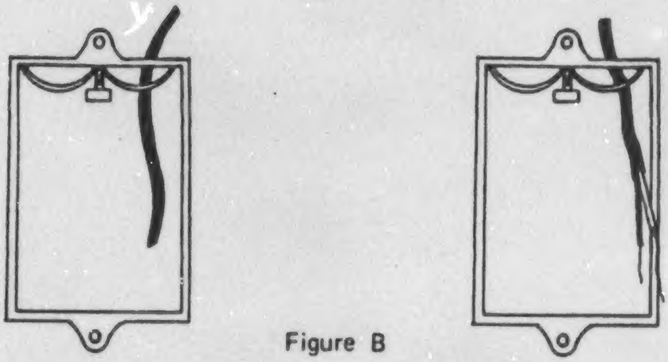
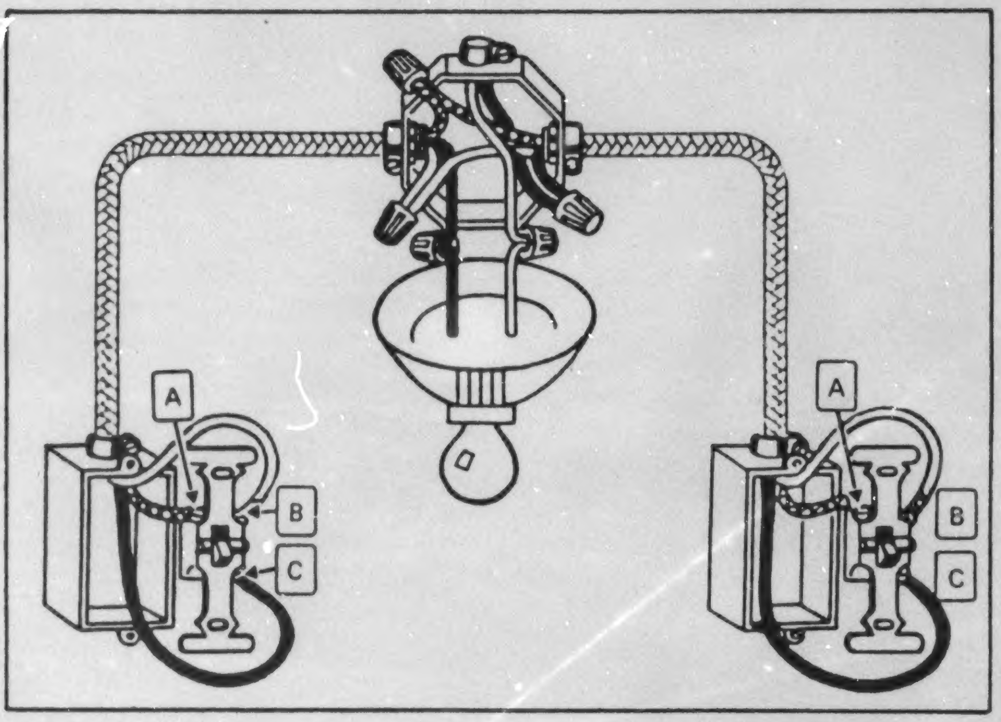


Figure B

## JOB SHEET #3: Wire a Lighting Outlet Controlled by Two Three-Way Switches

IV. Diagram of Procedure:

Figure C



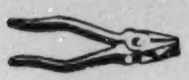
# HORTICULTURE MECHANICS

## UNIT 6

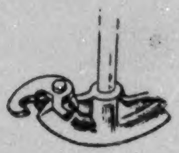
## TEST

1. Define the following terms:
   - a. Cable
   - b. Junction box
   - c. Single-pole toggle switch
   - d. Wire gauge
   - e. Wire size

2. Identify the following tools used in electrical wiring.



a.____________



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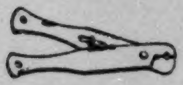
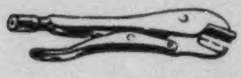


c.____________



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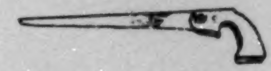
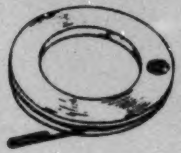
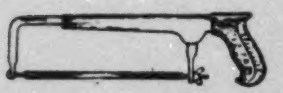


e.____________



f.____________



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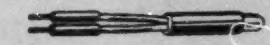
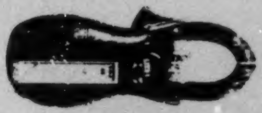
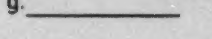


h.____________



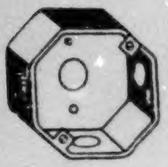
i.____________



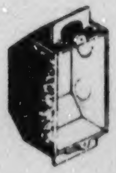
j.____________

# TEST

3. Identify the following electrical devices.



a.____________



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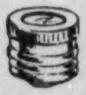

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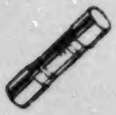

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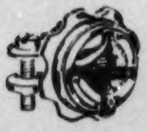

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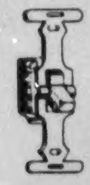

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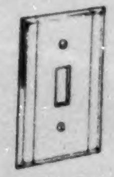
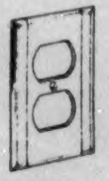
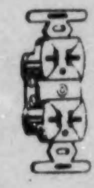


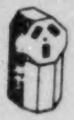
g.____________



h.____________



i.____________



j.____________

## TEST

4. Complete the following chart while identifying electrical conductors.

| ITEM | TYPE | Size AWG | Use |
|---|---|---|---|
| a. | | | |
| b. | | | |
| c. | | | |
| d. | | | |
| e. | | | |
| f. | | | |
| g. | | | |
| h. | | | |
| i. | | | |
| j. | | | |

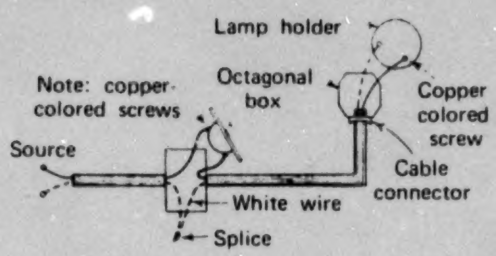
5. Name three factors affecting voltage drop.

6. Name the three-step procedure to follow in wiring.

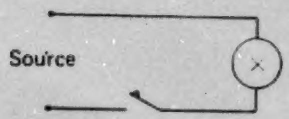
7. Draw a schematic diagram showing two lights connected in a series and controlled by a switch.

TEST

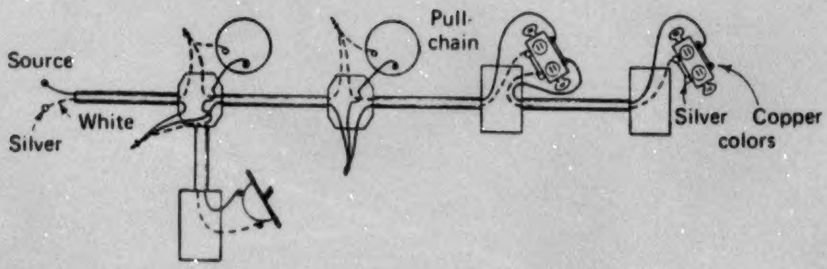
8. Identify the following drawings as either schematic or wiring diagrams.


Lamp holder
Octagonal box
Note: copper-colored screws
Copper colored screw
Source
Cable connector
White wire
Splice

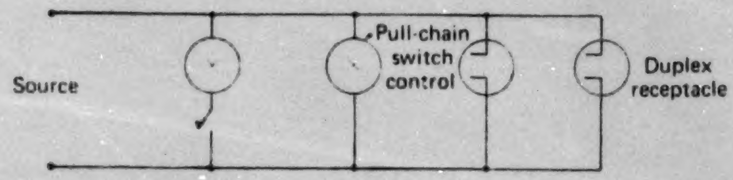
a.__________



b.__________


Source
White
Silver
Pull-chain
Silver
Copper colors

c.__________


Source
Pull-chain switch control
Duplex receptacle

d.__________

# HORTICULTURE MECHANICS

## UNIT 6

## ANSWERS TO TEST

1. a. Two or more wires put together inside an overall covering.
   b. An outlet box with a blank cover used to contain splices of a circuit
   c. A switch used to break the current in a single place.
   d. A tool used to measure wire diameter.
   e. The measure of wire diameter

2. a. Lineman's pliers
   b. Conduit bender
   c. Wire cutter, strippers
   d. Vise-grip pliers
   e. Keyhole saw
   f. Fish tape and reel
   g. Hacksaw
   h. Test light
   i. Amp volt meter
   j. Wood chisel

3. a. Octagon box
   b. Flush mount wall box
   c. Single element fuse, 30-amp, Edison plug type
   d. Time delay fuse, 40-amp, cartridge type
   e. Connector
   f. Toggle wall switch
   g. Cover for toggle wall switch
   h. Cover for duplex receptacle
   i. Duplex receptacle
   j. 50-amp, 115/230-V., cord receptacle cap

## ANSWERS TO TEST

4.

| ITEM | TYPE | Size AWG | Use |
|---|---|---|---|
| a. | | | |
| b. | | | |
| c. | | | |
| d. | | | |
| e. | | | |
| f. | | | |
| g. | | | |
| h. | | | |
| i. | | | |
| j. | | | |

5. Any three of the following:
   a. Length of wire
   b. Size of wire
   c. Number of amps flowing through wire
   d. Type of conductor

6. a. Draw the schematic diagram
   b. Draw the wiring diagram
   c. Install wire according to wiring diagram

7. Evaluation will be made by the instructor

8. a. Wiring
   b. Schematic
   c. Wiring
   d. Schematic

# HORTICULTURE MECHANICS

## UNIT 7

## PLANNING THE WIRING LAYOUT

### TERMINAL OBJECTIVE

Upon completion of this unit, students will be able to identify electrical symbols used in a wiring diagram and use those symbols in drawing a wiring diagram. They will be able to figure the number of branch circuits, select service entrance and panel, and determine wire size needed for branch circuits and service entrance switch. This objective will be considered achieved through demonstration and by scoring at least eighty-five percent on the test.

### SPECIFIC OBJECTIVES

After completion of this unit, students will be able to:

1. Define four terms associated with planning a wiring layout.
2. Identify ten symbols used in a wiring diagram.
3. Name requirements for adequately planning each of the following:
    a. Service entrance panel
    b. Branch circuit layouts
    c. Light and convenience outlets
    d. Special purpose outlets
    e. Arc welders
4. Name the three classification of branch circuits.
5. Apply the rule for figuring the number of branch circuits required. (Assignment Sheet #1)
6. Apply the rule for selecting the proper service entrance switch. (Assignment Sheet #1)
7. Apply the rule for selecting the proper wire size for branch circuits and service entrance switches. (Assignment Sheet #1)
8. Construct a wiring diagram using the farm shop plan provided and calculate the total watts required and select the proper service entrance switch. (Assignment Sheet #2)

## HORTICULTURE MECHANICS

## UNIT 7

## SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with Information and Assignment Sheets
3. Make transparencies
4. Discuss Terminal and Specific Objectives
5. Discuss Information and Assignment Sheets
6. Take field trip to observe a wiring layout being installed
7. Give Test

Students:

1. Read Objectives
2. Study Information Sheets
3. Work assignment sheets and turn in to instructor
4. Participate in field trip
5. Take Test

## INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheets
3. Transparency Masters
    TM 1 - Electrical Symbols
    TM 2 - Branch Circuits
    TM 3 - Service Entrance Panel
4. Assignment Sheets
    #1 - Determine Branch Circuits, Service Entrance Switches, Wire Sizes for Branch Circuits, and Service Entrance Switch
    #2 - Draw a Wiring Diagram.
5. Answers to Assignment Sheets #1 and #2
6. Test
7. Answers to Test

## SUGGESTED ACTIVITIES

References:

1. Phipps, Lloyd J., H.F. McColly, L.L. Scranton, and G.C. Cook, Farm Mechanics Text and Handbook, Danville, Illinois: The Interstate Printers and Publishers, Inc.
2. Brown, Robert H. Farm Electrification. New York: McGraw-Hill Book Company, Inc.
3. Shop Planning, Basic Design of Shops and Service Centers, Thomas S. Colvin, American Association for Vocational Instructional Materials, Athens, Georgia.
4. Simplified Electric Wiring Handbook, Sears-Roebuck and Company, Chicago, Illinois.

# HORTICULTURE MECHANICS

## UNIT 7

## INFORMATION SHEET

I. Terms and Definitions

- A. Service entrance switch - A switch which connnects the entire wiring system in a building to the source of meter supply.
- B. Wiring plan - A sketch of the house floor plan showing lights, light switches, and outlet locations.
- C. Branch circuit - The portion of electric conductors that extends from the service entrance switch to a certain group of outlets or to a single outlet.
- D. Special purpose outlet - Any electrical appliance which requires an input voltage of 230 volts and any electrical motor having a horsepower rating greater than 1/3 horsepower.

II. Symbols Used in Wiring Diagram (TM 1)

- A. Lighting outlet
- B. Ceiling lighting outlet for recessed fixture (Outline shows shape of fixture).
- C. Continuous wireway for fluorescent lighting on ceilings. (Extend rectangular to show length of installation).
- D. Duplex convenience outlet
- E. Duplex convenience outlet - split wired
- F. Duplex convenience outlet for grounding
- G. Weatherproof duplex convenience outlet
- H. Floor outlet
- I. Special-purpose outlet (Indicate function: Welder, Air Compressor etc.)
- J. Single-pole switch
- K. Three-way switch
- L. Four-way switch
- M. Switch and pilot or indicator light
- N. Weatherproof switch
- O. Convenience outlet on drop cord

III. Planning the Layout for an agricultural building.

- A. Service entrance panel
  1. Each building shall have its own service and ground.

INFORMATION SHEET

2. The service-entrance panel should be located as near as possible to the center of the electrical load, or at a point near the greatest load.
3. Place the service-entrance panel not less than five feet above floor level and not more than 6 feet to center of the panel.

B. Branch circuit layouts

For agricultural buildings, 20-ampere branch circuits may be used to serve:

1. Permanently connected lighting equipment.
2. Convenience outlets for portable trouble lamps, drills, clippers, portable motors (1/3 horsepower and smaller), and miscellaneous appliances not in continuous service.
3. Portable electric heaters or heating appliances, 1500 watts or less.
4. Any combination of the above, subject to the following limitations:
   a. For known loads, the total load should not exceed 80 per cent of total branch - circuit rating (16 amperes) if the circuit supplies:
      1. Motor loads
      2. Portable appliances
      3. Loads which continue for long periods of time
   b. No single appliance should exceed 80 per cent of the branch - circuit rating (16 amperes).
   c. The total rating of fixed appliances should not exceed 50 per cent of the branch - circuit rating (10 amperes) if lighting and portable appliances are also supplied.
   d. In computing load of lighting units which employ ballasts, transformers, or autotransformers, use the total ampere rating of the unit, not the rating of the lamps.
   e. For unknown loads, estimate two amperes per outlet.

C. Light and Convenience Outlets

1. Need a light outlet about every 10 or 12 feet and 5-6 feet from the ends and side of a shop.
2. Recommend convenience outlets be placed at 10-foot intervals around the shop wall.
3. Work bench areas space the outlets about 5 feet apart and above the work bench.
4. Light outlets should be on separate circuits from convenience outlets.

D. Special Purpose Outlets

1. Special-purpose outlets are generally individual-equipment circuits.
2. Individual-equipment circuits should be installed for any of

INFORMATION SHEET

the following:

a. All motors ½-horsepower and larger.

b. All stationary appliances rated over 1200 watts.

c. All equipment which requires continuous service where interruptions should be kept to a minimum such as a heating system.

d. All 240-volt appliances

E. Arc Welders

1. Check with the local power supply company prior to installations.
2. Locate special-purpose outlet near the large door so the welder can be used either inside or outside of the shop.

F. Outside the Entrance Lighting

1. One of the more important lights is a flood light for general use outside the main entrance.

G. General Lighting

1. Mount lights about 10 or 12 feet high for ample machinery clearance.
2. Generally 300 watt reflector type bulbs are necessary at this height.
3. Fluorescent lamps should not be used in a shop without incandescent lamps because of the stroboscopic (motion stopping) effect, which could be hazardous with rotating machinery which might appear to be standing still.

H. Special Work Area Lighting

1. Workbench will need two 150 watt reflector bulbs mounted 4 feet above the bench. A 48 inch fixture equipped with two 40 watt flourescent tubes will provide as much light.
2. Drill press, tool grinder and similar equipment should have an adjustable-type lamp fastened to the equipment with a 50 or 60 watt bulb.

IV. Classification of Branch Circuits

A. 15/20-amp-general purpose

B. 20-amp-small appliance

C. 50-amp-special purpose individual outlet

V. Branch Circuit Requirements (TM 2)

A. 15/20-amp-general purpose

1. One 20 amp branch circuit for each 500 square feet of floor space.

INFORMATION SHEET

2. One 15 amp branch circuit for each 375 square feet of floor space.
3. Nine outlets per general purpose circuit.

(NOTE: This is according to the N.E.C.)

VI. Selecting Service Entrance Switch (TM 3).

A. *Minimum size allowed 60-amp

B. Add wattage, divide by 230 volts, equals amps

C. Standard sizes 60/100, 125, 150, and 200 amps

*The capacity of the entrance switch for a building must be selected on the basis of future as well as present loads.

VII. Selecting Proper Wire Size.

A. Range from 14 to 0000 AWG

B. Table showing related sizes of wires

| Wire size AWG Number | Wire rating amp |
|---|---|
| 14 | 15 |
| 12 | 20 |
| 10 | 30 |
| 8 | 40 |
| 6 | 50 |
| 4 | 70 |
| 3 | 80 |
| 2 | 95 |
| 1 | 110 |
| 1/0 | 125 |
| 2/0 | 145 |
| 3/0 | 165 |
| 4/0 | 195 |

C. Branch circuit wires

| | Ampere wattage rating | Wire size, AWG | Wire rating, amp | Maximum device, amp |
|---|---|---|---|---|
| Branch Circuit: | | | | |
| 20-amp general and small Appliance | 20 amp | 12 | 20 | 20 |
| Individual Arc Welder | 12,000 watts | 8 | 50 | 50 |
| Individual Table Saw | 3,600 watts | 10 | 30 | 30 |

## INFORMATION SHEET

| Service entrance cable: | (AWG) WIRE SIZE | (AMP) WIRE RATING | MAXIMUM DEVICE AMPS |
|---|---|---|---|
| For a 30-amp service entrance switch | 8 | 40 | 30 |
| For a 60-amp service entrance switch | 6 | 50 | 60 |
| For a 70-amp service entrance switch | 4 | 70 | 70 |
| For a 100-amp service entrance switch | 2 | 95 | 100 |
| For a 125-amp service entrance switch | 1/0 | 125 | 125 |
| For a 150-amp service entrance switch | 2/0 | 150 | 150 |
| For a 200-amp service entrance switch | 4/0 | 195 | 195 |

(NOTE: Over 100-amp, use conduit and appropriate wire and fuses.)

VIII. Wiring Floor Plan.

A. Circuits

| | | | | |
|---|---|---|---|---|
| 1. | Arc Welder | 240 volts | 50.0 amps | 8/3 wire |
| 2. | Table Saw | 240 volts | 15.0 amps | 14/3 wire |
| 3. | Grinder | 120 volts | 4.2 amps | 12/2 wire |
| 4. | Air Compressor | 120 volts | 4.2 amps | 12/2 wire |
| 5. | Power Hacksaw | 120 volts | 20 amps | 12/2 wire |
| 6. | General Purpose | " | " | " |
| 7. | General Purpose | " | " | " |
| 8. | General Purpose | " | " | " |
| 9. | General Purpose (Spare) | " | " | " |
| 10. | General Purpose (Spare) | " | " | " |

(NOTE: For each 240-volt outlet add one additional circuit.)

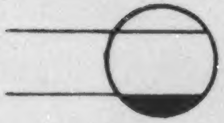
B. Example of calculations

| | |
|---|---|
| 1. 20-amp circuits (5 circuits) | |
| First 2--2 x 1700 watts | 3,400 |
| Others 3--3 x 600 watts | 1,800 |
| 2. Welder 12,000 watts | |
| Cout first 6,000 watts | 6,000 |
| 10% of 12,000 = 1,200 | 1,200 |
| 3. Special purpose circuits | |
| Table Saw 1 hp x 1,000 | 1,000 |
| Grinder ½ hp x 1,000 | 500 |
| Air Compressor ½ hp x 1,000 | 500 |
| Power Hacksaw 1/3 hp x 1,200 | 400 |

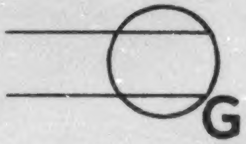
14,800 ÷ 240 = 61.7

(NOTE: Requires a 70 amp service entrance switch.)

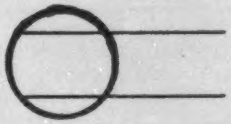
# Electrical Symbols



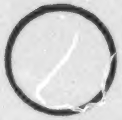
Duplex Convenience Outlet-Split Wired



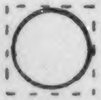
Duplex Grounding Outlet



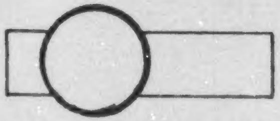
Duplex Convenience Outlet



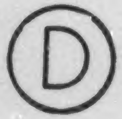
Lighting Outlet



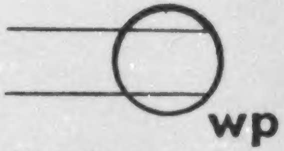
Ceiling Lighting Outlet



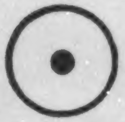
Fluorescent Lighting



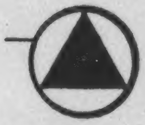
Convenience Outlet or Drop Cord



Weatherproof Duplex Outlet



Floor Outlet



Special-Purpose Outlet

**S**

Single-Pole Switch

$S_3$

Three-Way Switch

$S_4$

Four-Way Switch

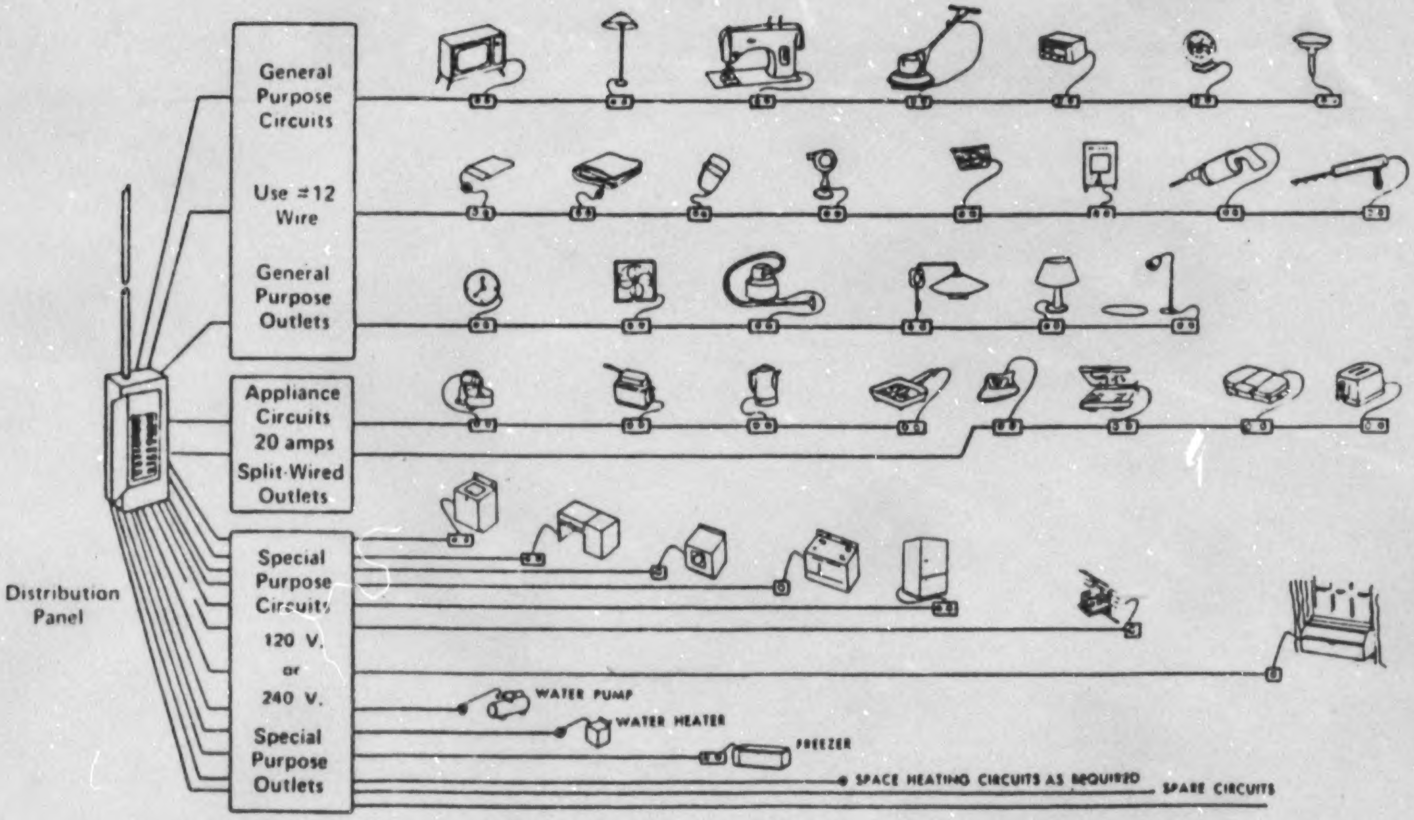
$S_p$

Switch and Pilot

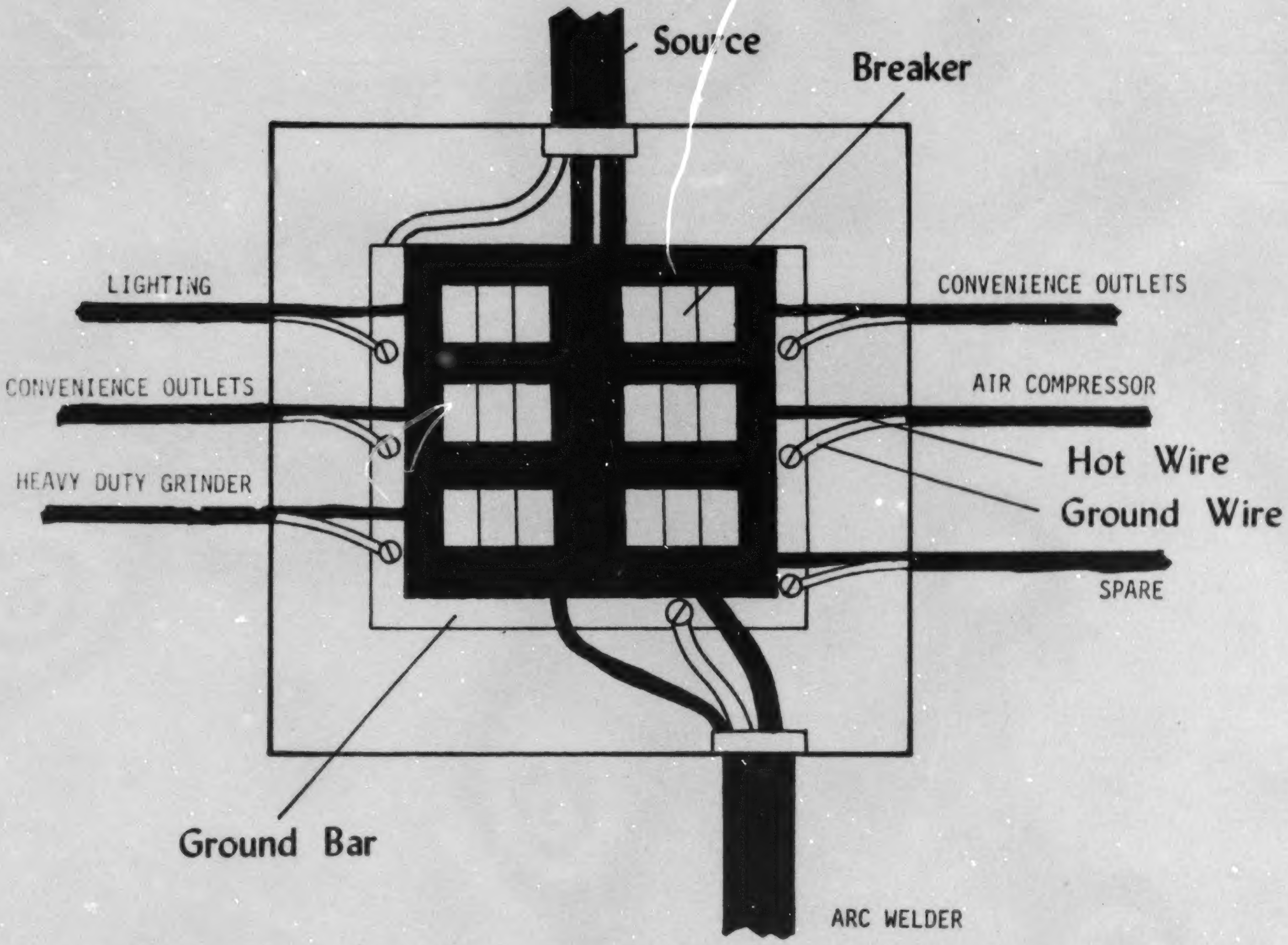
$S_w$

Weatherproof Switch

# Branch Circuits


General Purpose Circuits
Use #12 Wire
General Purpose Outlets
Appliance Circuits 20 amps
Split-Wired Outlets
Special Purpose Circuits
120 V. or 240 V.
Special Purpose Outlets
Distribution Panel
WATER PUMP
WATER HEATER
FREEZER
SPACE HEATING CIRCUITS AS REQUIRED
SPARE CIRCUITS

# SERVICE ENTRANCE PANEL


Source
Breaker
LIGHTING
CONVENIENCE OUTLETS
CONVENIENCE OUTLETS
AIR COMPRESSOR
HEAVY DUTY GRINDER
Hot Wire
Ground Wire
SPARE
Ground Bar
ARC WELDER

# HORTICULTURE MECHANICS

## UNIT 7

## ASSIGNMENT SHEET #1: Determine Branch Circuits, Service Entrance Switch, and Wire Sizes for Branch Circuits and Service Entrance Switch

The following data was obtained after planning the type and location of outlets for a new residence.

18 - 20 amp general and lighting outlets
6 - 20 amp small appliance outlets
1 - Water heater 4,500 watts
1 - Freezer 1/3 hp. motor
1 - Range 16,000 watts
1 - Dishwasher 1/3 hp. motor
1 - Dryer 6,000 watts

Using the information above complete the following questions.

A. What is the number of branch circuits required?

B. What size wire should be used for each branch circuit?

C. What size service entrance switch should be used?

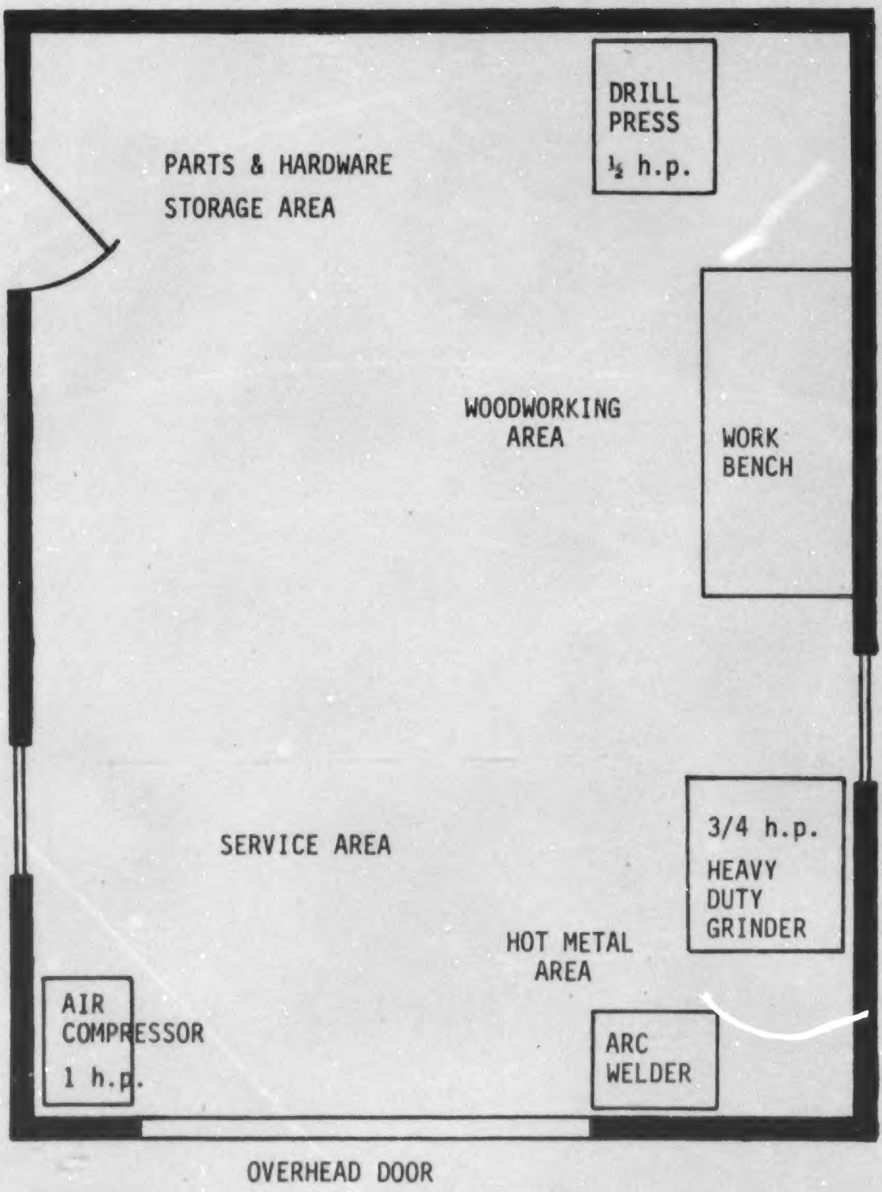
D. What size wire should be used for the service entrance switch?

# HORTICULTURE MECHANICS

## UNIT 7

## ASSIGNMENT SHEET #2: Draw a Wiring Diagram

Draw a wiring diagram using the floor plan below. When finished with the drawing, calculate the number of branch circuits required, size of service entrance switch needed, and determine size of wire to use for each branch circuit and service entrance wire.


DRILL PRESS ½ h.p.
PARTS & HARDWARE STORAGE AREA
WOODWORKING AREA
WORK BENCH
SERVICE AREA
3/4 h.p. HEAVY DUTY GRINDER
HOT METAL AREA
AIR COMPRESSOR 1 h.p.
ARC WELDER
OVERHEAD DOOR

# HORTICULTURE MECHANICS

## UNIT 7

## ANSWERS TO ASSIGNMENT SHEET #1

A. 18 General and lighting outlets

22 ÷ 9 = 2.3 therefore 3 circuits

2 extra circuits needed because of two 240-volt outlets

3 + 2 = 5 circuits

B.

| | |
|---|---|
| General purpose outlets | 12/2 g AWG |
| Welder | 8/3 AWG |
| Grinder | 12/2 g AWG |
| Table Saw | 14/3 AWG |
| Air Compressor | 12/2 g AWG |
| Power Hacksaw | 12/2 g AWG |

C.

| | |
|---|---|
| 20-amp circuits (4 circuits) | |
| First two 2 x 1,700 - 3,400 | 3,400 |
| Others 2 x 600 = 1,200 | 1,200 |
| Range 16,000 watts | |
| Count first 8,000 | 8,000 |
| 16,000 - 12,000 = 4,000 in excess of 12,000 4 x 400 = 1,600 | 1,600 |
| Special individual circuits | |
| Water heater | 4,500 |
| Freezer 1/6 hp x 1,200 = 200 | 200 |
| Dryer 6,000 watts | 6,000 |
| Dishwasher 1/3 hp x 1,200 = 400 | 400 |
| | 25,300 watts |

25,300 ÷ 240 = 105 amps

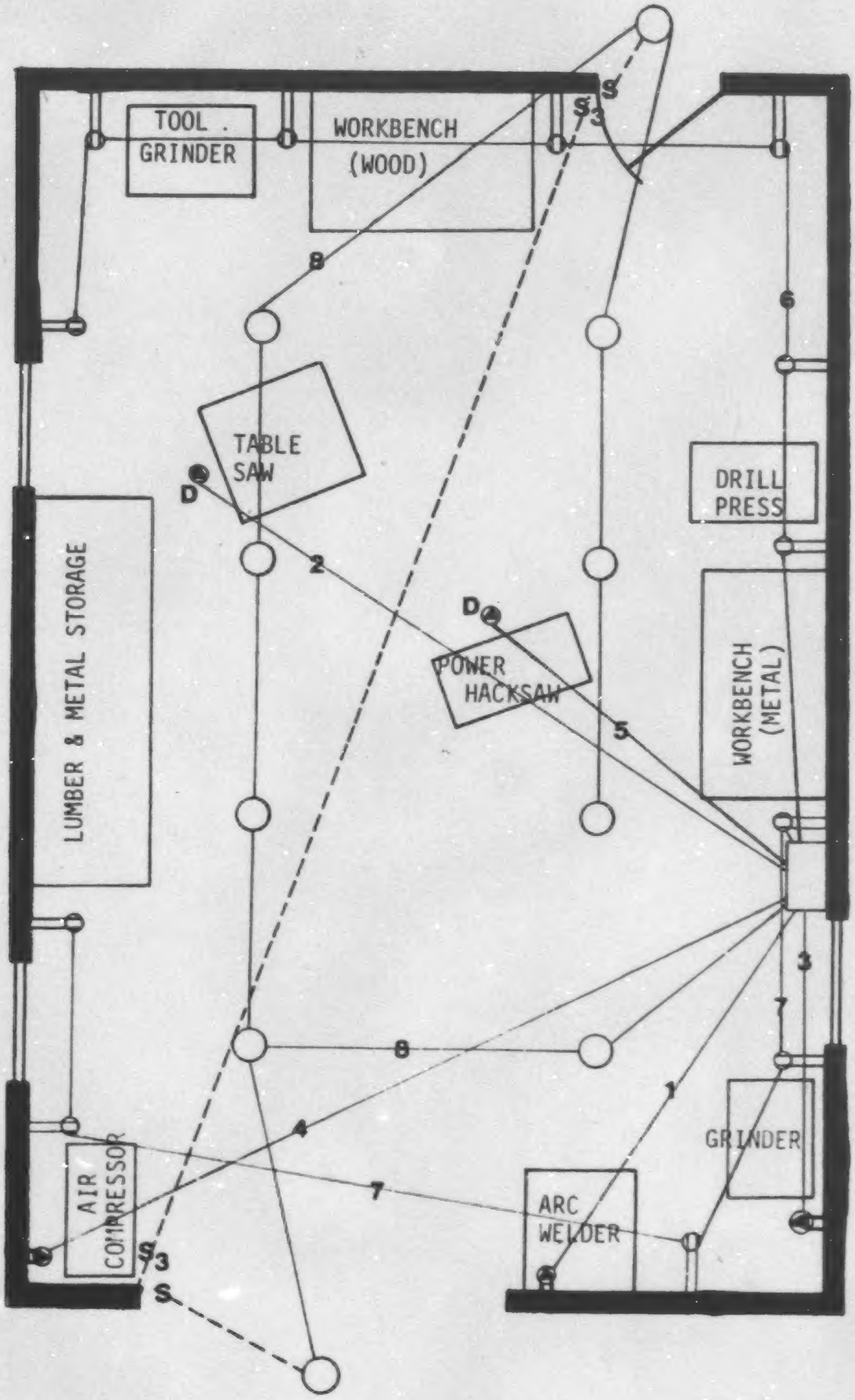
(NOTE: Use 125-amp service entrance switch.)

D. Use No. 1/0 AWG wire

# HORTICULTURE MECHANICS

## UNIT 7

## ANSWERS TO ASSIGNMENT SHEET #2


TOOL GRINDER
WORKBENCH (WOOD)
S
S3
8
6
TABLE SAW
D
DRILL PRESS
2
D
POWER HACKSAW
5
WORKBENCH (METAL)
LUMBER & METAL STORAGE
3
7
8
1
4
GRINDER
7
ARC WELDER
AIR COMPRESSOR
S3
S

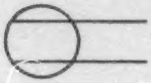
# HORTICULTURE MECHANICS

## UNIT 7

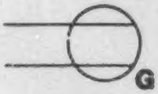
## TEST

1. Define the following terms:
   - a. Service entrance switch
   - b. Wiring plan
   - c. Branch circuits
   - d. Special purpose outlet

2. Identify the following electrical symbols:



a. ____________________



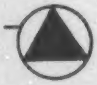
b. ____________________

$S_3$

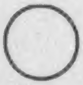
c. ____________________

S

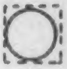
d. ____________________



e. ____________________



f. ____________________



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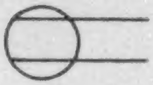
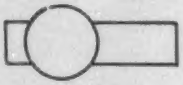
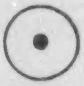


h. ____________________



i. ____________________



j. ____________________

## TEST

3. Name the requirements for adequately planning each of the following:
    a. Service entrance panel
    b. Branch circuit layouts
    c. Light and convenience outlets
    d. Special purpose outlets
    e. Arc welders
4. Name the three classifications of branch circuits.
5. Complete Assignment Sheet #1 to the satisfaction of the instructor.
6. Complete Assignment Sheet #2 to the satisfaction of the instructor.

# HORTICULTURE MECHANICS

## UNIT 7

## ANSWERS TO TEST

1. a. A switch which connects the entire wiring system in a building to the source of meter supply.

   b. A sketch of the house floor plan showing lights, light switches and outlet locations.

   c. The portion of electric conductors that extends from the service entrance switch to a certain group of outlets or to a single outlet.

   d. Any electrical appliance which requires an input voltage of 230 volts and any electrical motor having a horsepower rating greater than 1/3 horsepower.

2. a. Duplex convenience outlet

   b. Duplex grounding outlet

   c. Three-way switch

   d. Single-pole switch

   e. Special purpose outlet

   f. Lighting outlet

   g. Ceiling lighting outlet for recessed fixture

   h. Duplex convenience outlet - split wired

   i. Fluorescent lighting outlet

   j. Floor outlet

3. a. Each building shall have its own service and ground.

   The service entrance panel should be located as near as possible to the center of the electrical load, or at a point near the greatest load.

   Place the service entrance panel not less that five feet above floor level and not more than 6 feet to center of the panel.

   b. Permanently connected lighting equipment.

   Convenience outlets for appliances not in continuous service.

   Portable heaters, 1500 watts or less.

   For known loads, the total load should not exceed 80 per cent of total branch if circuit supplies motor loads, portable appliances, or loads which continue for long periods of time.

   No single appliance should exceed 80 per cent of branch circuit rating (16 amperes).

   For unknown loads, estimate two amperes per outlet.

## ANSWERS TO TEST

c. Need a light outlet about every 10 or 12 feet and 5 to 6 feet from the ends and side of a shop.

d. Convenience outlets should be placed at 10 foot intervals around the shop wall.

Work bench areas space the outlets about 5 feet apart and above the work bench.

Light outlets should be on separate circuits from convenience outlets.

d. Special purpose outlets are generally individual equipment circuits.

Individual equipment circuits should be installed for any of the following: all motors 1/2 horsepower and larger; all stationary appliances rated over 1200 watts; all equipment which requires continuous service; and all 240-volt appliances

e. Check with local power supply company prior to installation.

Locate special purpose outlet near the large door so the welder can be used either inside or outside of the shop.

4. 15/20 amp - general purpose

   20 amp - small appliance

   50 amp - special purpose individual outlet

5. Complete Assignment Sheet #1 to the satisfaction of the instructor.

6. Complete Assignment Sheet #2 to the satisfaction of the instructor.